

April 8, 2008

I 35 ()
Environmental Assessment
McLennan County
CSJs: 0015-01-165; 0015-01-179 and 0015-01-186

IH 35 from South FM 2837 to FM 2063 in Hewitt


Janice W. Brown
Division Administrator
Federal Highway Administration
Austin, Texas 78701

Dear Ms. Brown:

Attached are three copies of the revised environmental assessment covering the above-described project for your review and approval. This revision addresses the comments made by Mr. Kevin Spohrer in his letter dated March 28, 2008. A separate attached memorandum specifically responds to Mr. Spohrer's comments. Coordination with the Texas Historical Commission (THC) for archeology was completed on December 12, 2002. Coordination with THC for historic structures was completed on July 21, 2004. Texas Parks and Wildlife Department coordination was completed on January 14, 2008.

Your approval is requested that this project is satisfactory for further processing. If you have any questions regarding this project, please contact Juan Valera-Lema at (512) 416-2646

Sincerely,



James P. Barta, Jr., P.E.
Project Management Section Director
Environmental Affairs Division

Attachments

Satisfactory for Further Processing



4/28/08

**Environmental Assessment
For
IH 35 from FM 2837 to FM 2063
McLennan County, Texas**

CSJ#s:

0015-01-165
0015-01-179
0015-01-186

Prepared by:

Texas Department of Transportation
Waco District Office
Waco, Texas

and

Federal Highway Administration, Texas Division
Austin, Texas

April 2008

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I. NEED FOR AND PURPOSE OF THE PROJECT

I.A. NEED FOR THE PROPOSED IMPROVEMENTS

The Texas Department of Transportation (TxDOT) – Interstate Project Office proposes to widen IH 35 from South FM 2837 in Lorena to FM 2063 in Hewitt in McLennan County, Texas, a length of approximately 5.85 miles (see **Figure 1**). The need for the proposed improvements is based on projected traffic increases and safety issues.

No major reconstruction has taken place within the limits of this proposed project since the original construction in the 1960s. The bridges and a majority of the pavement structure are over 40 years old. Generally, pavements are designed for a life of 20 to 30 years. Loads carried by trucks have increased greatly, with even greater loads in the future due to the North American Free Trade Agreement (NAFTA). Due to the increase in the number of vehicles and increased loads, the base structure of the pavement needs substantial improvements.

Regardless of the planned expansion of the corridor, the existing facility is in need of design upgrades to meet current freeway standards. In many areas throughout the corridor, IH 35 was designed and constructed before criteria had been fully developed for this type of facility. In newer sections, design criteria have changed since construction. Consequently, many of the existing design elements do not meet current design standards or safety requirements. Some vertical and horizontal curves need to be upgraded. Many bridges do not meet required clearances. Exit and entrance ramps need to be lengthened to provide acceleration and deceleration lanes to improve the safety of entering and exiting vehicles. Two-way frontage roads need to be converted to one-way in order to provide safer highway operations at ramps and to conform to driver expectancy. A continuous barrier wall should be installed in the center median to improve safety.







From the project's southern terminus at South FM 2837 to North FM 2837, through the city of Lorena, the existing facility consists of two 12-foot main lanes divided by a continuous concrete barrier (CTB), with ten-foot outside shoulders. The northbound frontage road between South FM 2837 and North FM 2837 is separated from the main lanes by a 57-foot wide (typical) median. The northbound frontage road consists of two 12-foot lanes. The southbound frontage road in this area is separated from the main lanes by a 47-foot (typical) median. The southbound frontage road also consists of two 12-foot lanes.

From North FM 2837 to the project's northern terminus at FM 2063, the existing facility consists of two 12-foot main lanes with six-foot inside and ten-foot outside shoulders in each direction. The northbound frontage road is separated from the main lanes by a 21-foot wide (typical) median. The northbound frontage road consists of two 12-foot lanes, with two-foot outside shoulders. The southbound frontage road is separated from the main lanes by a 30-foot wide (typical) median. The southbound frontage road consists of two 12-foot lanes. The existing overall right-of-way width is typically 274 feet throughout the project area. See **Figure 2a** for the existing typical sections.

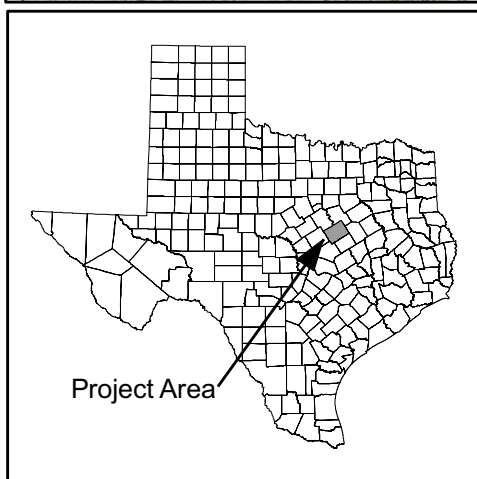
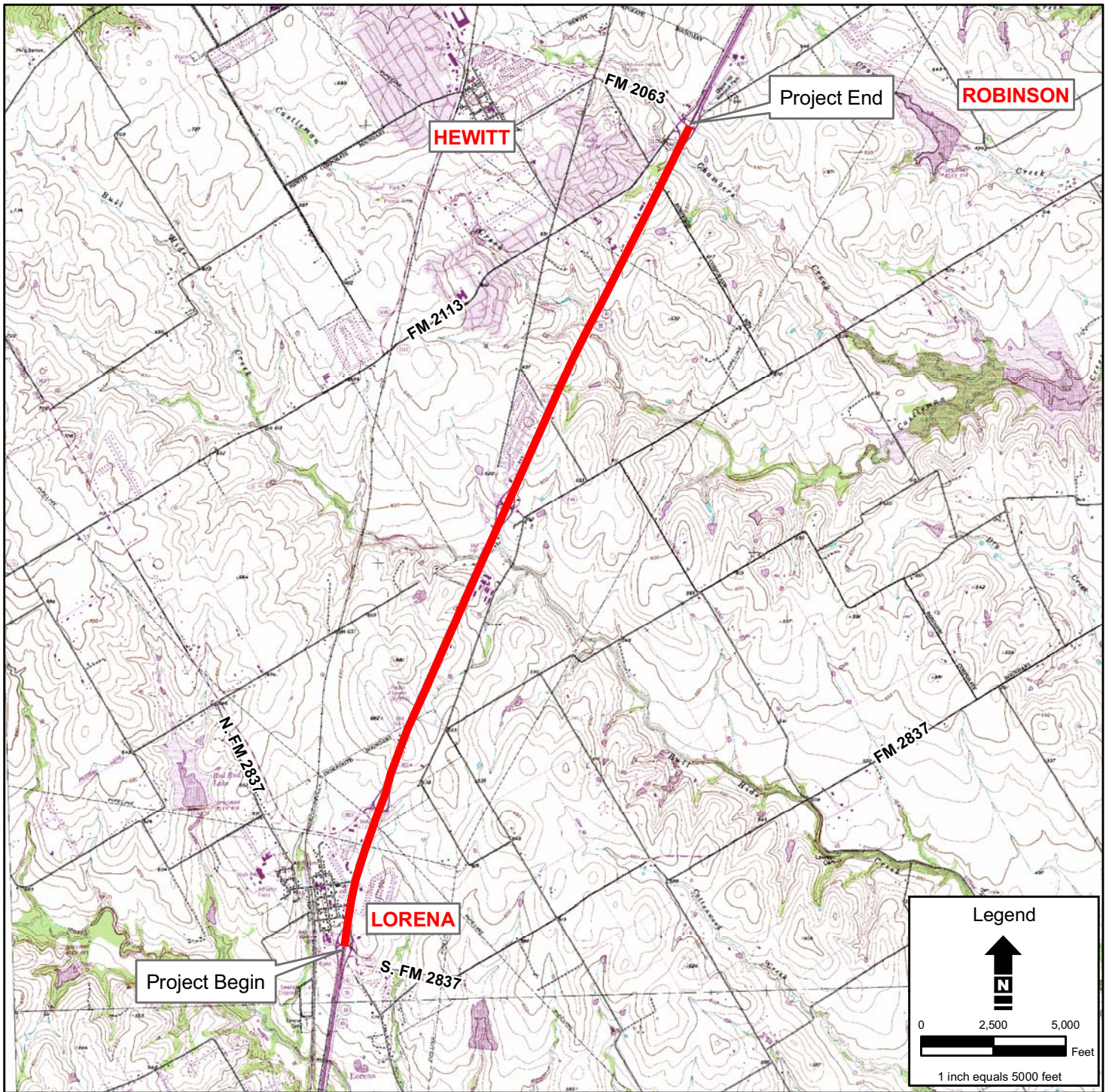
The construction of the section of IH 35 from Lorena to Waco was completed in 1958. Traffic studies in 1965 revealed that 8,690 vehicles per day (vpd) used the facility. By 1975, studies indicate that the average daily traffic (ADT) on this section had increased to 18,250 vpd. In 1985 the ADT reached 26,000 vpd, increasing to 48,000 vpd in 1995. The ADT for 1999 was estimated at 51,000 vpd. Traffic through this corridor is expected to increase by 50 percent to 100 percent over the next 20 years. In this segment between FM 2837 and FM 2063, traffic is projected to reach 102,000 vpd by 2029 and 114,600 vpd by 2039. If this trend continues, the ADT could exceed projected traffic figures.

The measure of a highway's operation condition as perceived by the driver is characterized as that highway's Level of Service (LOS). LOS is broken into categories ranging from A to F, with A representing free-flow operations and F representing traffic congestion. In the publication *A Policy on Geometric Design of Highways and Streets*, AASHTO (the American Association of State Highway Officials) recommends that freeways and their auxiliary facilities should generally be designed for LOS C in urban areas and LOS B in rural areas. LOS D may be acceptable in heavily developed sections of metropolitan areas and LOS C in rural areas with unusually high traffic volumes. Presently, IH 35 through this section operates at LOS D. The projected traffic increases would result in LOS F through this entire section in the years 2029 and 2039.

Levels of Service

Level of Service	Flow Conditions	Technical Descriptions
A		Highest quality of service. Traffic flows freely with little or no restrictions on speed or maneuverability. No delays
B		Traffic is stable and flows freely. The ability to maneuver in traffic is only slightly restricted. No delays
C		Few restrictions on speed. Freedom to maneuver is restricted. Drivers must be more careful making lane changes. Minimal delays
D		Speeds decline slightly and density increases. Freedom to maneuver is noticeably limited. Minimal delays
E		Vehicles are closely spaced, with little room to maneuver. Driver comfort is poor. Significant delays
F		Very congested traffic with traffic jams, especially in areas where vehicles have to merge. Considerable delays

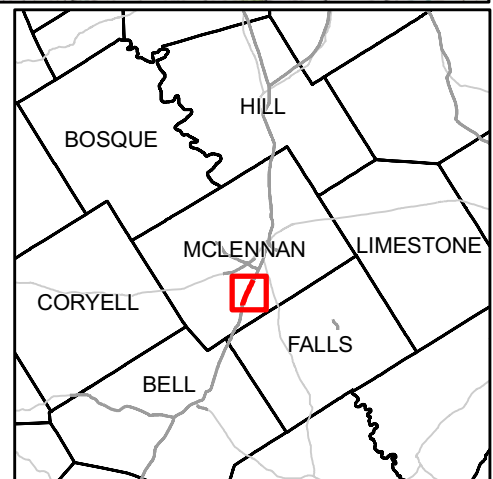
Source: California Department of Transportation (Caltrans), 2003

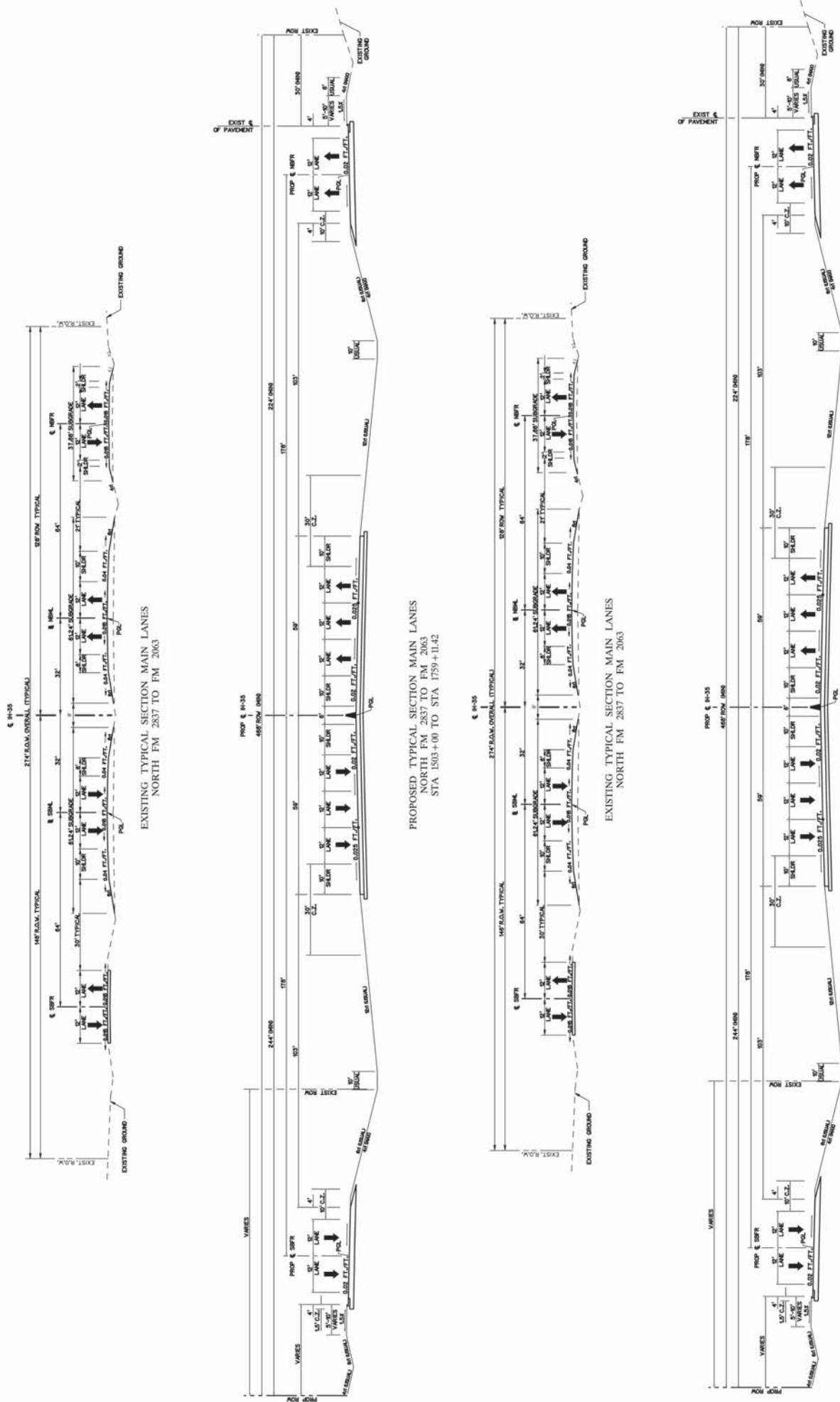


IH 35 - FM 2837 to FM 2063
Section 3B

Project Location

Figure 1





PROPOSED TYPICAL SECTION MAIN LANES
NORTH FM 2837 TO FM 2063
STA 1503+00 TO STA 1759+11.42

Existing and Proposed Typical Sections
Figure 2a



Proposed Typical Sections Figure 2b

Accident data for this section are shown in **Table 1**. According to this data, the ADT in this section increased 20 percent from 1994 to 1998, while the number of accidents fluctuated with no resulting trend. A total of 174 accidents were reported during the five-year period. Of those, 56 resulted in injuries and four involved fatalities. In 1994, approximately 68 percent of the accidents in this section occurred on the mainlanes. This number increased to 75 percent by 1998. During this period, five accidents involved vehicles on the mainlanes traveling in opposite directions. As ADT continues to increase, the number and severity of accidents is likely to increase if no improvements are made to the facility.

Table 1 Accident Data for IH 35 from FM 2837 to FM 2063										
Year	ADT	Accidents	Location			Severity				
			Main lanes	Frontage Roads	Other	Non-Injury	Possible Injury	Non-Incapacitating Injury	Incapacitating Injury	Fatal
1994	41,000	44	30	14	0	27	3	8	5	1
1995	48,000	26	18	8	0	13	7	4	2	0
1996	45,000	29	20	9	0	13	4	7	2	3
1997	45,000	31	18	12	1	11	9	8	3	0
1998	49,000	44	33	11	0	15	12	9	8	0
Total	—	174	119	54	1	79	35	36	20	4

Frequently, accidents on the mainlanes result in the temporary closure of one or two travel lanes. When an accident blocks both lanes, traffic is diverted to the frontage roads, which are not capable of accommodating mainlane traffic, especially in urban areas with high local use of frontage roads. The existence of two-way frontage roads further complicates this situation. Two-way frontage roads also contribute to a higher probability of accidents, especially at ramps. During the period from 1994 through 1998, six accidents occurred at ramps in this section and ten accidents involved vehicles traveling in opposite directions on the frontage roads.

The frequency of accidents and increasing traffic volumes along IH 35, and the resulting traffic congestion in recent years have established a need for additional capacity along the facility. This proposed project would provide the needed expansion from South FM 2837 in Lorena to FM 2063 in Hewitt.

I.B. PURPOSE OF THE PROPOSED PROJECT

The purpose of this project is to improve existing pavement and structural conditions, provide additional capacity to meet future traffic demands, mitigate geometric deficiencies, and bring the highway into conformance with current design standards and criteria in order to improve safety for the traveling public on IH 35.

An investigation was conducted in 1999 through the joint efforts of the FHWA and the Departments of Transportation in Texas, Oklahoma, Kansas, Missouri,

Iowa and Minnesota to study the IH 35 corridor from Laredo, Texas to Duluth, Minnesota. The purpose of the investigation was to assess the need for improvement of the existing IH 35 facilities and to define a plan to address the needed improvements. The study determined that approximately 65 percent of the facility would require substantial improvements to accommodate the anticipated traffic. The study further determined that the portion of the corridor between Dallas/Fort Worth and Laredo has the highest percent of truck volumes.

IH 35 is the only interstate highway connecting Mexico, the United States and Canada through the central part of the United States and is one of two north-south interstate highways traversing Texas. The other north-south interstate highway is IH 45, which extends from Galveston to Dallas. Since January 1994, when the North American Free Trade Agreement (NAFTA) went into effect, IH 35 has become a major international trade route, resulting in a 10 to 20 percent increase in truck traffic. Currently, the percentage of trucks using this corridor ranges from 25 to 30 percent.

The area between San Antonio and the IH 35 East/West split north of Hillsboro has been identified as one of the “bottleneck” areas in which the number of lanes narrows from three lanes of traffic in each direction to two lanes. In the southbound direction at the East/West split, currently four lanes merge into two where IH 35 West meets IH 35 East. During periods of heavy traffic flow this results in traffic congestion with unacceptable delay times, which does not meet the current American Association of State Highway Officials (AASHTO) recommendations for Level of Service (LOS), discussed in detail in **Section I.B.1**. Currently, construction is underway from San Antonio to south of the Williamson/Bell county line to increase the capacity to three lanes of traffic in each direction. Additional capacity is being planned for IH 35 from the Williamson/Bell county line to the IH 35 East/West split. Six planning sections have been identified to increase the capacity within this corridor. The section described in this document, extending from South FM 2837 in Lorena to FM 2063 in Hewitt, comprises the center portion of Section 3. This section consists of two logical termini, and would have independent utility regardless of other IH 35 improvements.

The length of the project is approximately 5.85 miles. Approximately 134.3 acres of additional right-of-way would be required for the construction of the proposed project. The proposed project is included in the 2008-2011 Statewide Transportation Improvement Plan (STIP). According to the STIP, the estimated construction cost would be \$66,100,000.

I.C. OBJECTIVES OF THE PROJECT

The proposed improvements would address the following project objectives:

- Improve existing pavement and structural conditions;
- Provide additional capacity to meet future traffic demands;
- Mitigate geometric deficiencies;
- Meet current design standards and criteria to improve safety for the traveling public; and
- Avoid or minimize adverse social, economic, and environmental impacts.

I.D. FOCUS OF THIS ENVIRONMENTAL ASSESSMENT

The project objectives and environmental issues were a primary focus in the planning, design, and environmental analysis process. **Section I.D.1** describes the planning process, including public involvement; **Section I.D.2** describes related studies; **Section I.D.3** lists the issues studied in detail; and **Section I.D.4** discusses issues eliminated from further study. For context, see **Appendix A – Potential Environmental Constraints Plates (1-1 through 1-5, 2-1 through 2-5)** and **Appendix B – Project Area Photos**.

I.D.1. Planning Process

The proposed project has been developed in accordance with the procedural provisions of the National Environmental Policy Act (NEPA), the Council on Environmental Quality *Regulations for Implementing the Procedural Provisions of NEPA*, Code of Federal Regulations Title 23 Highways Part 771 *Environmental Impact and Related Procedures*, Federal Highway Administration (FHWA) Technical Advisory T 6640.8A, the Texas Administrative Code Title 43 Part I Chapter 2 Subchapter C *Environmental Review and Public Involvement for Transportation Projects*, the 2004 TxDOT Environmental Manual, and Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

I.D.1.1 TxDOT Planning Process

The Texas Transportation Commission and TxDOT use the Unified Transportation Plan (UTP) as TxDOT's ten-year plan for transportation project development. The Statewide Transportation Improvement Program (STIP) is a staged, four-year, statewide, intermodal program of transportation projects that is consistent with the Statewide Transportation Plan (STP) planning processes and metropolitan plans. The proposed improvements to IH 35 are part of Priority 1 of the Waco Metropolitan Transportation Plan: *Connections 2030 – The Waco Metropolitan Transportation Plan (MTP)* with statewide mobility funds. They are also included in the 2008-2011 STIP (Category 4 – Statewide Connectivity Corridor Projects).

I.D.1.2 Public Involvement

A total of four public meetings were held as part of the project planning process. Information was made available in Spanish and other languages upon request. The first public meeting was held on June 29, 2000 at the Lorena High School commons in Lorena, Texas. One hundred four (104) private citizens and sixteen (16) public officials attended the meeting. The purpose of the meeting was to present to the public the proposed IH 35 project, from South FM 2837 in Lorena to FM 2063 in Hewitt, and to obtain feedback from the public. The public was provided with various displays including aerial photography, typical roadway sections, existing environmental constraints, and construction phasing information. Five verbal and four written comments were recorded. Citizens

were concerned about construction phasing, noise, relocations, and one-way frontage roads. Responses to the verbal comments were provided at the public meeting; these and the responses to the written comments are provided in the Summary of Comments in **Appendix C**. The responses included that TxDOT ensures the necessary relocation of businesses and residences during the right-of-way acquisition process, that noise impacts were studied, and that TxDOT takes into account access issues of residents and other vehicles while also considering safety and mobility issues.

In order to provide better opportunity for individual questions, two additional public meetings were held to discuss the proposed IH 35 project between South FM 2837 and FM 2063. The second meeting was held on May 3, 2001, to discuss the section of the project from south of South FM 2837 to North FM 2837 in Lorena, and a third meeting was held on May 8, 2001 to discuss the section of the project from North FM 2837 to FM 2063. The purpose of the meetings was to present proposed east and west alternative schematic designs, along with environmental constraints information, and to receive comments from the public. Three public officials and 50 citizens attended the May 3rd meeting. Six verbal comments were made at the meeting. Three written comments were received after the meeting. The public expressed concern about the growth of traffic and noise on the interstate, access due to ramp reversals and one-way frontage roads, and the need for an additional cross-structure at Lorena.

Three public officials and 37 citizens attended the May 8, 2001 meeting. No verbal comments were made at the meeting. Seven written comments were received concerning ramp location, one-way frontage roads, access due to ramp reversals and the need for exit signage during construction.

The fourth public meeting was held at the Hewitt Community Center on January 25, 2007. Nine public officials and 52 citizens attended the meeting. Following the meeting, information about the project, including maps of design alternatives, were made available on the TxDOT website (http://www.dot.state.tx.us/about_us/public_hearings_and_meetings/waco_district/default.htm). Comments regarding the proposed improvements were accepted via the website for ten days following the public meeting. A total of 40 comments were received at or following the meeting. Eleven comments supported the east option, ten supported the compressed option, two supported the west option, two supported the alternating option, and two preferred either the east or alternating options. Other comments expressed concerns regarding signage and access for businesses, one-way frontage roads, traffic barriers, and noise barriers.

Complete public involvement documentation is available at the TxDOT Waco District Office in Waco, Texas and is summarized in **Appendix C**. A public hearing will be conducted after the EA is determined to be satisfactory for further processing by FHWA.

I.D.2

Related Studies and Relevant Documents

The widening of IH 35 is taking place on a segment-by-segment basis. The adjacent segments of roadway that are being analyzed by TxDOT are shown in **Table 2**.

Table 2 Studies on Adjacent Segments of IH 35				
Segment	Project Limits	CSJ #	Type	Status
3A-1	N LP 363 to N of Troy	0015-04-067	Suburban	EA underway
3A-2	N of Troy to Falls Co. Line	0015-04-073	Urban	EA underway
3A-2	Bell Co. Line to McLennan Co. Line	0015-03-035	Rural	EA underway
3A-3	Falls Co. Line to 4.0 MI N of SH 7	0015-02-048	Urban	EA underway
3A-3	4.0 MI N of SH 7 to South FM 2837	0015-01-187	Rural	EA underway
3B*	S FM 2837 to FM 2063	0015-01-186	Urban, Suburban	EA underway
3C	FM 2063 to S LP 340/SH 6	0015-01-162	Suburban	EA underway

*Current project.

Hewitt and Waco are part of the Waco Metropolitan Planning Organization. According to *Connections 2030 – The Waco Metropolitan Transportation Plan (MTP)*, there are several projects in the study area that were part of the 2006-2008 TIP. Hewitt Drive/FM 1695 Extension from IH 35 to Spring Valley Road (FM 2113) is under construction. Hewitt Drive from FM 2063 (Sun Valley Road) to 0.85 mile north of FM 2113 (Spring Valley Road) is anticipated to let in 2009. A dynamic overhead message sign for IH 35 just north of FM 2063/FM 2113 was let in 2007, along with improvements to IH 35 from SH 6 to FM 2063 (CSJ 0015-01-162). The current IH 35 proposed improvements are contained in the MTP as federally funded projects to be funded between fiscal years 2005 and 2015. Other projects that fall in or adjacent to the study area include improvements to Old Temple Road, FM 2837, Grieg Drive, and Baxley Street are listed in the MTP but are considered unfunded/beyond 2030 projects.

See **Chapter IV** Indirect and Cumulative Effects for a full listing of IH 35 projects.

I.D.3 Issues Studied in Detail

The following issues merit further study and are considered relevant to the proposed IH 35 improvements:

- Traffic noise
- Air quality
- Wildlife and vegetation
- Water resources (including waters of the U.S. and wetlands)
- Relocations and right-of-way (including land use)
- Hazardous materials
- Archeology
- Historic resources
- Indirect and cumulative effects

Chapter III Affected Environment and Environmental Consequences addresses these issues in detail.

I.D.4 Issues Eliminated from Further Study

The following issues were evaluated and determined not to have any influence or bearing on the findings of this EA or decision resulting from this assessment:

- Socioeconomics (including environmental justice)
- Construction effects
- Economic and employment impacts
- Travel patterns and accessibility
- Airway-highway clearance
- Utilities
- Public facilities and services
- Recorded cemeteries
- Section 6(f) properties
- Floodplains
- Groundwater resources
- Geology and soils including farmland protection
- U.S. coast guard permits
- Coastal coordination
- Essential fish habitat
- Threatened and endangered species
- Railroad issues
- Section 4(f) Resources

A discussion of each issue eliminated from further study is provided below.

I.D.4.1 Socioeconomics (including Environmental Justice)

I.D.4.1.a Population Trends

This section occurs along IH 35 from FM 2837 in Lorena to FM 2063 in Hewitt and Robinson in McLennan County. McLennan County's population growth was fairly steady in the decades between 1970 and 2000. However, during each decade between 1970 and 2000, the State grew at almost twice the rate of the County. The period of fastest growth for the County occurred between 1970 and 1980, when the population grew by 15.7 percent. During that same time period, the State's population grew by 27.1 percent (see **Table 3**).

Table 3 Historic Population Trends for the State of Texas, McLennan County, 1970-2000		
Year	State of Texas	McLennan County
1970	11,198,655	147,553
<i>Percent Change 1970-1980</i>	27.1%	15.7%
1980	14,229,191	170,755

Table 3 Historic Population Trends for the State of Texas, McLennan County, 1970-2000		
Year	State of Texas	McLennan County
<i>Percent Change 1980-1990</i>	19.4%	10.8%
1990	16,986,510	189,123
<i>Percent Change 1990-2000</i>	22.8%	12.9%
2000	20,851,820	213,517

Source: U.S. Census Bureau, 2000.

Both the Texas State Data Center (TSDC) and the Texas Water Development Board (TWDB) anticipate increased growth in McLennan County in the future. The highest growth estimate shown in **Table 4** was produced by the TSDC, which projects the population of McLennan County to grow from 213,517 in 2000 to 268,500 in 2030, an increase of 25.8 percent. The TWDB projections show the McLennan County population growing from 213,517 in 2000 to 266,002 in 2030, an increase of 24.6 percent.

Table 4 Population Projections for McLennan County, Texas		
Year	Texas Water Development Board	Texas State Data Center
2000	213,517	213,517
2010	231,882	231,484
2020	250,398	251,104
2030	266,002	268,500
<i>Percent Change 2000-2030</i>	24.6%	25.8%

Sources:

Texas Water Development Board. 2006. *2006 State Water Plan Population Projections by County*

Texas State Data Center. 2006. *Population 2000 and Projected Population 2005-2040 by Race/Ethnicity and Migration Scenario for McLennan County*.

I.D.4.1.b Race and Ethnicity

The data collected by the U.S. Census Bureau for 2000 allow for analysis of the racial and ethnic compositions of the project area. See **Figure 3** for census blocks and block groups relevant to the proposed project area. **Tables 5** and **6** show 2000 Census data for the project area block groups and blocks directly affected, respectively. City, county and state data are included for comparison purposes. As seen in **Table 5**, McLennan County was composed primarily of non-Hispanic White persons (64.6 percent) in 2000. Whereas 32 percent of the State's population was Hispanic or Latino persons of any race, only 17.9 percent of McLennan County's population was Hispanic. The largest non-Hispanic minority group in McLennan County was Black or African American persons, comprising 15.0 percent of the population in 2000 (compared to 11.3 percent in Texas). The remaining categories of minorities constituted one percent or less of the County's population.

The cities of Hewitt, Robinson and Lorena are located in McLennan County (see **Figure 3**) and had more homogenous populations than the County. Whereas 64.6 percent of the County's population was comprised of non-Hispanic White persons, 79.4 percent of Hewitt's population was White. Black or African American persons comprised 7.6 percent of the population and Asians comprised 2.3 percent of the population. The remaining categories of minority races constituted less than one percent of the City of Hewitt's population. Hispanic or Latino persons comprised 9.3 percent of the population.

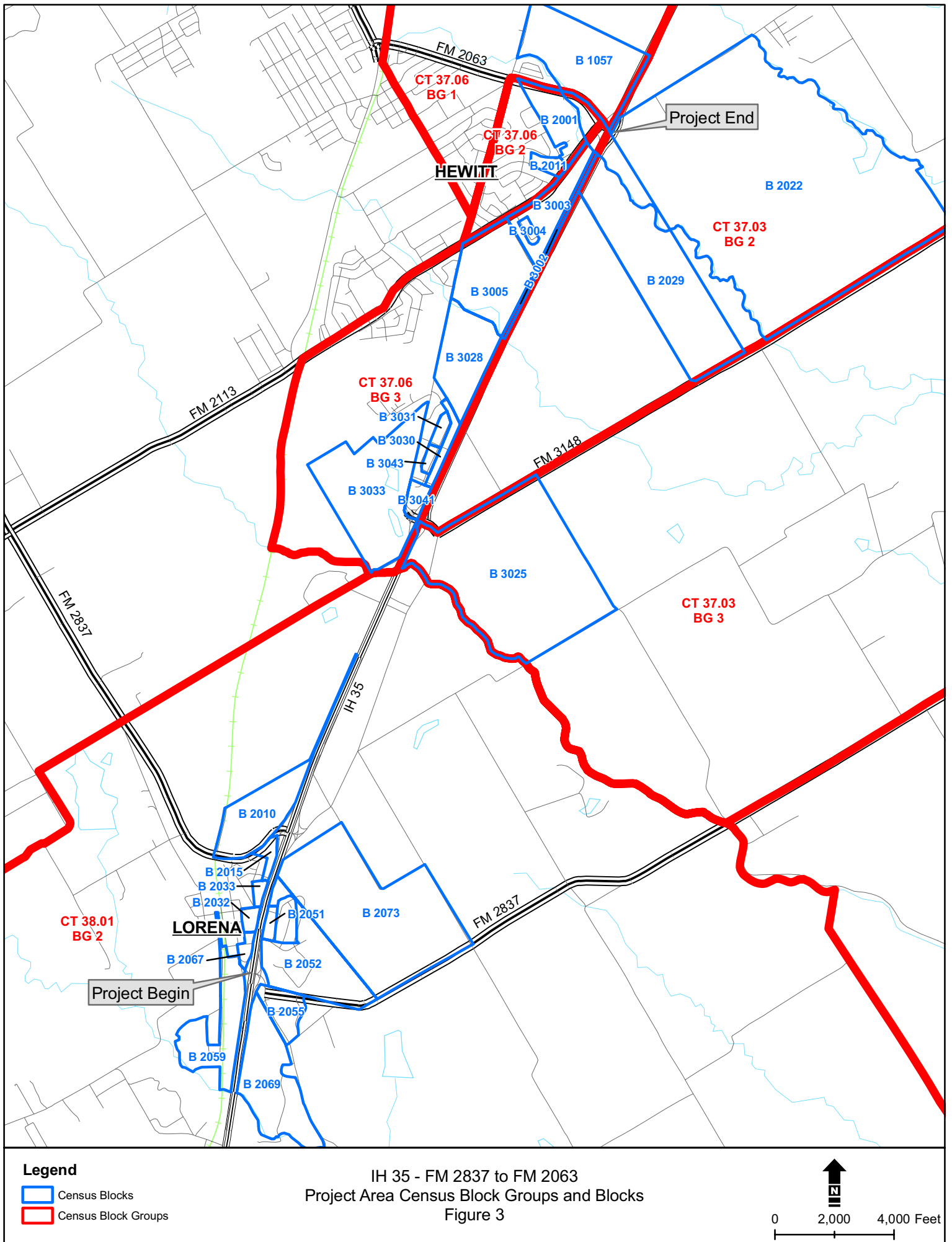
In Robinson, 84.7 percent of the population was White, and 2.1 percent of the population was Black or African American. The remaining categories of minority races constituted less than one percent of the City's population. Hispanic or Latino persons comprised 9.0 percent of the population. In Lorena, the majority of the population was also comprised of non-Hispanic White persons (91.6 percent) in 2000. The remaining categories of minority races constituted one percent or less of Lorena's population. Approximately six percent of the population was Hispanic or Latino (see **Table 5**).

Six Census block groups are crossed or are adjacent to the proposed project. These include: Block Groups (BG) 2 and 3 in Census Tract (CT) 37.03, BG 1, 2, and 3 in CT 37.06, and BG 2 in CT 38.01, all in McLennan County. According to the 2000 Census, the six project area block groups had a similar demographic composition to Hewitt and were more diverse than Lorena (**Table 5**). The majority of persons in the six block groups were White, while the percentage of Hispanic persons ranged from seven percent in BG 2 of CT 37.06 to 10.7 percent in BG 2 of CT 37.03. The percentage of Black persons ranged from 0.9 percent in BG 2 of CT 37.03 and BG 2 in CT 38.01 to 7.7 percent in BG 3 of CT 38.01. No other race comprised more than three percent of the population of any block group in the project area.

Table 5 Race and Ethnicity Characteristics, 2000											
	BG 2, CT 37.03	BG 3, CT 37.03	BG 1, CT 37.06	BG 2, CT 37.06	BG 3, CT 37.06	BG 2, CT 38.01	City of Hewitt	City of Lorena	City of Robinson	McLennan County	Texas
Total population	1,054	1,065	1,638	1,203	1,652	3,148	11,085	1,433	7,845	213,517	20,851,820
Hispanic or Latino	113	98	127	84	134	222	1,029	84	706	38,233	6,669,666
Percentage of total	10.7%	9.2%	7.8%	7.0%	8.1%	7.1%	9.3%	5.9%	9.0%	17.9%	32.0%
White	922	940	1,413	1,013	1,344	2,845	8,800	1,312	6,857	138,008	10,933,313
Percentage of total	87.5%	88.3%	86.3%	84.2%	81.4%	90.4%	79.4%	91.6%	84.7%	64.6%	52.4%
Black or African American	10	14	42	56	128	27	840	14	164	32,065	2,364,255
Percentage of total	0.9%	1.3%	2.6%	4.7%	7.7%	0.9%	7.6%	1.0%	2.1%	15.0%	11.3%
American Indian and Alaska Native	1	4	1	6	4	12	42	2	24	666	68,859
Percentage of total	0.1%	0.4%	0.1%	0.5%	0.2%	0.4%	0.4%	0.1%	0.3%	0.3%	0.3%
Asian	1	3	43	31	25	16	256	13	37	2,236	554,445
Percentage of total	0.1%	0.3%	2.6%	2.6%	1.5%	0.5%	2.3%	0.9%	0.5%	1.0%	2.7%
Native Hawaiian and Other Pacific Islander	1	0	0	3	1	7	7	0	1	77	10,757
Percentage of total	0.1%	0.0%	0.0%	0.2%	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.1%
Some other race	4	1	2	2	1	4	6	2	5	147	19,958
Percentage of total	0.4%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Population of two or more races	2	5	10	8	15	15	105	6	51	2,085	230,567
Percentage of total	0.2%	0.5%	0.6%	0.7%	0.9%	0.5%	0.9%	0.4%	0.7%	1.0%	1.1%

Source: U.S. Census Bureau, Census 2000, SF1, P4.

Table 6 summarizes race and ethnicity data for the population in Census blocks crossed by or adjacent to the proposed project. According to the 2000 Census, 41 of the 68 blocks did not have a population. The remaining 27 blocks had a



population of 1,295 persons, of which 83.4 percent were White persons, 7.5 percent were Hispanic persons, and 5.9 percent were Black persons. The remaining 3.2 percent was spread among other races. The racial and ethnic composition of the blocks immediately adjacent to the project is similar to the six block groups, although there is a higher percentage of Black persons in some adjacent blocks compared to the block groups (Blocks 3003, 3030 and 3043 in CT 37.06).

Table 6 Race and Ethnicity for Project Census Blocks, 2000

Table 6 Race and Ethnicity for Project Census Blocks, 2000											
Census Tract	Block Group	Block	Total population	Hispanic or Latino	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some other race	Population of two or more races
37.03	2	Block 2022	53	2	51	0	0	0	0	0	0
		Block 2029	27	0	27	0	0	0	0	0	0
	3	Block 3025	4	0	1	1	0	0	0	1	1
37.06	1	Block 1057	4	0	4	0	0	0	0	0	0
	2	Block 2001	90	18	55	0	0	17	0	0	0
		Block 2011	82	13	64	3	0	0	0	2	0
	3	Block 3002	8	0	8	0	0	0	0	0	0
		Block 3003	95	8	69	18	0	0	0	0	0
		Block 3004	47	2	38	6	0	0	1	0	0
		Block 3005	6	0	1	5	0	0	0	0	0
		Block 3028	3	0	0	3	0	0	0	0	0
		Block 3030	99	11	78	10	0	0	0	0	0
		Block 3031	79	13	66	0	0	0	0	0	0
		Block 3033	78	0	61	8	3	6	0	0	0
		Block 3041	9	0	9	0	0	0	0	0	0
		Block 3043	79	3	60	14	0	1	0	0	1
	38.01	2	Block 2010	7	2	5	0	0	0	0	0
Block 2015			75	4	69	0	0	0	0	0	2
Block 2032			8	0	7	0	0	1	0	0	0
Block 2033			50	0	50	0	0	0	0	0	0
Block 2051			23	0	23	0	0	0	0	0	0
Block 2052			205	8	184	9	0	3	0	1	0
Block 2055			92	5	87	0	0	0	0	0	0
Block 2059			4	0	4	0	0	0	0	0	0
Block 2067			9	0	9	0	0	0	0	0	0
Block 2069			49	6	43	0	0	0	0	0	0
68 Block Total			1295	97	1080	77	3	28	1	4	5
68 Block Percent			100.0%	7.5%	83.4%	5.9%	0.2%	2.2%	0.1%	0.3%	0.4%

Source: U.S. Census Bureau, 2000, SF1, P4.

Signed on February 11, 1994, Presidential Executive Order 12898 (U.S. Office of the President, 1994), requires that each Federal Agency “shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low income populations...” In a memorandum concerning Executive Order 12898, the President states that federal agencies should collect and analyze information concerning a project’s effects on minorities or low-income groups, when required by federal law. In the past, TxDOT guidelines for performing environmental justice assessments have defined minority populations to include: (1) Blacks, (2) Hispanics, (3) Asian Americans, and (4) American Indians and Alaskan Natives, according to the definitions used by the

U.S. Census Bureau for the 1990 census (and prior censuses). For the 2000 census, these categories were refined to include the following: (1) Black or African American, (2) American Indian and Alaska Native, (3) Asian, (4) Native Hawaiian and Other Pacific Islander, (5) Some Other Race, and (6) Two or More Races.

Low-income persons can be defined as those whose median household incomes are below the U.S. Census Bureau Poverty Threshold. See **Section I.D.4.3** for project area data, in addition to the discussion below.

I.D.4.1.c Environmental Justice Effects

The proposed project would require one residential relocation along the eastern side of IH 35 at Surrey Ridge Road, just south of FM 2063 in Hewitt in Block 2029 of CT 37.03. The residence appears to be unoccupied and dilapidated. According to the 2000 Census, there were 27 people residing in this block, 100 percent of which identified themselves as White. The proposed project would improve the existing infrastructure, provide additional capacity, and improve safety for the traveling public. It would not adversely impact travel costs, modes of transportation, and accessibility. There would be noise impacts at two residences: one in Block 3003 in CT 37.06 (which is one of the blocks with a higher percentage of Black persons compared to the larger project area), and the other in Block 2069 in CT 38.01. According to 2000 Census block group data, these areas are not low-income compared to the poverty guideline, and have comparable economic characteristics to the other project block groups. It is unknown whether or not the businesses to be displaced (Johnson Equipment Auction Yard, Steve Palmer Homes, Home Center of Waco, and Bobcat of Waco) are minority-owned or serve a particular demographic segment of the population. See also **Section III.E.3**. Based on the above discussion and analysis, the proposed project would not cause disproportionately high and adverse effects on any minority populations or low-income populations as per Executive Order 12898 regarding Environmental Justice.

I.D.4.1.d Limited English Proficiency

Executive Order 13166, “Improving Access to Services for Persons with Limited English Proficiency” requires Federal agencies to examine the services they provide and identify any need for services to those with limited English proficiency (LEP). E.O. 13166 requires Federal agencies to work to ensure that recipients of Federal financial assistance provide meaningful access to their LEP applicants and beneficiaries. Failure to ensure that LEP persons can effectively participate in or benefit from Federally assisted programs and activities may violate the prohibition under Title VI of the Civil Rights Act of 1964, 42 U.S.C. 2000d and Title VI regulations against national origin discrimination.

A review of English proficiency in the project area was conducted. Census data for populations speaking English “not well” or “not at all” were compiled and percentages of the total block group population were calculated. It should be noted that only sample data are available as this question was only posed to a sample of the population participating in Census data collection. Nonetheless, the percentages can be used to estimate limited English proficiency needs in the project study area.

As shown in **Table 7**, the six block groups (BGs) in the project area have a percentage of persons limited in English proficiency (LEP) of approximately 1.3

percent, which is comparable to that of Hewitt and Robinson, and lower than Lorena and McLennan County. There does not appear to be a large LEP population in the project area. Of those that did not speak English well or at all in the project area, approximately half spoke a language other than Spanish at home (see **Table 7** note). There were no requests for translated materials at the public meetings.

Table 7 Limited English Proficiency, 2000												
	BG 2, CT 37.03	BG 3, CT 37.03	BG 1, CT 37.06	BG 2, CT 37.06	BG 3, CT 37.06	BG 2, CT 38.01	6 BG Total	Hewitt	Lorena	Robinson	McLennan County	Texas
Total population 5 years and older	1,001	998	1,550	1,031	1,537	2,899	9,016	9,962	1,340	7,439	198,274	19,241,518
Population that speaks English "not well" or "not at all"	0	23	32	17	0	42	114	78	28	69	6,984	1,428,512
Percent that speaks English "not well" or "not at all"	0.0%	2.3%	2.1%	1.6%	0.0%	1.4%	1.3%	0.8%	2.1%	0.9%	3.5%	7.4%
Percent LEP that speaks Spanish at home	N/A	100.0%	31.3%	0.0%	N/A	59.5%	50.9%	43.6%	57.1%	82.6%	93.2%	92.2%

Source: U.S. Census Bureau, Census 2000, SF3, P19.

*Note: in BG 1 of CT 37.06, roughly two thirds of the LEP population spoke an Asian or Pacific Island language. In BG 2 of CT 38.01, roughly one third of the LEP population spoke either an Indo-European language or an Asian or Pacific Island language.

I.D.4.2 Economic and Employment Impacts

In the first quarter of 2006, McLennan County employed a total of 100,943 persons, an increase of 4.2 percent from 2002 when the County employed 96,888 persons. The top three employment sectors in terms of jobs in 2006 were Service and Other (21,972 jobs), Trade, Transportation, and Utilities (18,167 jobs), and Manufacturing (15,692 jobs). No industries grew more than 20 percent between 2002 and 2006; the highest growth rate was in the Education and Health Services industry (12.8 percent). Three industries showed declines over that time period: Natural Resources and Mining (17.7 percent), Construction (5.7 percent), and Federal Government (3.8 percent). See **Table 8**.

Table 8 First Quarter Employment by Industry for McLennan County, 2002-2006						
Industry	2002	2003	2004	2005	2006	% Change 2002-2006
Natural Resources & Mining	350	296	299	284	288	-17.7%
Construction	5567	5,458	5,543	5,272	5,251	-5.7%
Manufacturing	14,062	13,172	13,298	15,927	15,692	11.6%
Trade, Transportation, & Utilities	17,880	17,326	17,260	17,798	18,167	1.6%
Finance	5,663	5,693	5,902	5,761	5,963	5.3%
Education & Health	13,405	14,137	14,669	15,164	15,118	12.8%

Table 8 First Quarter Employment by Industry for McLennan County, 2002-2006						
Industry	2002	2003	2004	2005	2006	% Change 2002-2006
Service & Other	21,795	22,281	22,280	22,024	21,972	0.8%
Local Government	10,961	11,152	11,129	11,220	11,190	2.1%
State Government	2,566	2,550	2,546	2,619	2,839	10.6%
Federal Government	4,639	4,603	4,555	4,539	4,463	-3.8%
Total Employment	96,888	96,669	97,480	100,608	100,943	4.2%

Source: Texas Workforce Commission. 2006. *Quarterly Employment and Wages – First Quarter 2002-2006*

As **Table 9** shows, the unemployment rate was consistently lower in McLennan County than in the State of Texas between 2000 and 2006. In 2003, the unemployment rate in McLennan County was at its highest at 6.1 percent, but it was still lower than the State of Texas' unemployment rate during that year (6.7 percent). Since then, the unemployment rate in the county has declined and was 4.8 percent in 2006.

Table 9 Average Annual Unemployment Rates in Texas and McLennan County, 2000-2005			
Year	State of Texas Unemployment Rate	McLennan County Unemployment Rate	McLennan County Civilian Labor Force
2000	4.4%	4.2%	103,656
2001	5.0%	4.8%	103,811
2002	6.4%	5.7%	106,776
2003	6.7%	6.1%	109,387
2004	6.0%	5.4%	111,314
2005	5.4%	5.0%	113,603
2006	4.9%	4.8%	113,340

Source: Texas Workforce Commission. *Labor Market & Career Information – Not seasonally adjusted. 2007.*

The U.S. Census Bureau uses a poverty threshold to determine the poverty level for statistical purposes. The U.S. Department of Health and Human Services calculates a poverty guideline to determine financial eligibility for certain programs. In 2007, the poverty guideline is \$20,650 for a family of four. Table 10 summarizes median household income, median home values, and poverty rates for the project area block groups. The poverty rate shows the percentage of persons living below the Census Bureau poverty level in 1999.

Based on data from the 2000 Census, the median household income in 1999 in the six project block groups exceeded the federal poverty guideline and ranged from \$37,619 in BG 3 of CT 37.03 to \$68,889 in BG 3 of CT 37.06, compared to \$55,469 in Hewitt, \$47,891 in Lorena, \$49,404 in Robinson, and \$33,560 in McLennan County. In 2000, all of the six project area block groups had higher median home values for owner-occupied housing units than Lorena and McLennan County, except for BG 3 in CT 37.03, and the values were comparable to that of Hewitt. See **Table 10**.

Table 10 Project Area Income, Home Values, and Poverty Rates, 2000					
Census Tract	Block Group	Median household income in 1999	Median Home Value (Owner-Occupied Housing Units)	Persons in Poverty	Poverty Rate
37.03	2	\$54,702	\$92,400	2	0.2%
	3	\$37,619	\$78,600	47	4.4%
37.06	1	\$61,413	\$87,300	23	1.4%
	2	\$53,375	\$87,900	32	2.8%
	3	\$68,889	\$92,300	13	0.8%
38.01	2	\$47,480	\$83,200	112	3.5%
6 BG Total		N/A	N/A	229	2.4%

Table 10 Project Area Income, Home Values, and Poverty Rates, 2000					
Census Tract	Block Group	Median household income in 1999	Median Home Value (Owner-Occupied Housing Units)	Persons in Poverty	Poverty Rate
Hewitt		\$55,469	\$88,300	311	2.9%
Lorena		\$47,891	\$80,500	72	5.0%
Robinson		\$49,404	\$78,400	342	4.4%
McLennan County		\$33,560	\$67,700	35,977	17.6%
Texas		\$39,927	\$77,800	3,117,609	15.4%

Source: U.S. Census Bureau, Census 2000, SF3, P53, P87, H76.

The expansion of IH 35 would have direct and indirect effects on regional and state employment and income. Generalizations about the project's economic effects can be made using the Texas Input-Output Model (Texas Comptroller of Public Accounts, 1989). When multiplied by the total construction cost of the project, estimated at \$121,835,527, the factors produce estimates of the economic impacts of project construction on a statewide basis. For the proposed project, the direct effects of highway construction on state income total approximately \$35,234,833. Indirect income totals approximately \$70,652,420 and total direct and indirect effects for the state economy amount to \$105,887,253 of income generated.

To reflect the limited duration of employment effects, jobs created by the construction project are expressed as person-years of employment which does not necessarily imply the creation of a new job. Statewide jobs supported directly by the project are estimated here to be approximately 3,328 person-years of employment. Jobs indirectly supported by the project total 3,229 person-years of employment, for a total (direct plus indirect) of 6,556 person-years of employment for the state. Employment effects would be temporary, however, lasting about as long as the construction project. The total statewide output of goods and services for the project would be approximately \$449,390,340 created by the construction costs of the proposed project. The *proportion* of economic effects retained locally depends on capturing local materials and labor during the construction process. See **Table 11**.

Table 11 Estimates of Statewide Economic Effects Created from the Expansion of IH 35							
Construction Cost	Direct Income	Indirect Income	Total Income	Direct Employment	Indirect Employment	Total Employment	Statewide Final Demand
\$121,835,527	\$35,234,833	\$70,652,420	\$105,887,253	3,328	3,229	6,556	\$449,390,340

Source: Calculated using Texas Comptroller Office's Texas Employment, Income, and Final Demand Multipliers, 1992. Person-years of employment (rounded to whole numbers) over total construction period. Person-years of employment do not necessarily denote additional total employment.

Overall, the project would take place in an economically prosperous area with low unemployment and poverty rates and other indicators that reveal a stable economy. Short-term jobs during the construction phase would contribute to construction sector employment. However, the eight business displacements that would be required by the proposed project would affect the local economy depending on whether or not those businesses decided to relocate in the area. Also, it is likely that business activity along IH 35 between Lorena and Hewitt would be temporarily reduced, especially during the construction phase.

Three of the commercial structures to be displaced are currently vacant. The displacement of those structures, as well as the radio tower, would not impact customers or employees. Four of the commercial displacements could potentially have employee and customer impacts: Johnson Equipment Auction Yard, Steve Palmer Homes, Home Center of Waco, Bobcat of Waco. Based on business names, it appears that their customers may be regional rather than local due to their size. These businesses are all located on the east side of the roadway near the IH 35 intersections with Old Temple Road and Baxley. There is a large amount of undeveloped land near these businesses, and they all appear to have large enough properties so that some or all of these businesses would be able to relocate further away from the roadway while remaining on their existing property. This would reduce any impacts to customers and employees. TxDOT would ensure access to the nine businesses that would incur driveway impacts, thus minimizing impacts to the businesses, their customers, and their employees.

I.D.4.3 Construction Phase Effects

The proposed improvements to IH 35 would entail some unavoidable disruption to traffic. To alleviate this disruption, the proposed project would be constructed in phases and a detailed traffic control plan would be developed and implemented.

Disruptions would be minimized to the extent possible by the timely notification of affected residents and business owners through posted notices, personal contact, or other notification procedures. These procedures would include rerouting the traffic, barricading, using traffic cones, or any other measures deemed necessary and prudent by TxDOT and the construction contractor to comply with all local, state, and federal traffic and safety regulations.

Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. Receivers are not anticipated to be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities is not expected. Provisions will be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measure such as work hour controls and proper maintenance of muffler systems.

Dry, windy weather has the potential to create significant dust problems in the vicinity of construction project that require excavation and/or earth moving. The contractor would control ambient dust problems by site watering.

I.D.4.4 Travel Patterns, Accessibility, and Community Cohesion

During the construction phase, travel patterns for project area residents could change. In addition, the conversion of two-way frontage roads to one-way frontage roads along IH 35 would require area residents to travel to the next interchange to drive the opposite direction as opposed to being able to turn

around in several places along the frontage road; however, the proposed roadway expansion would increase mobility and safety in the area overall, which could benefit local residents and businesses, as well as IH 35 through-travelers.

As stated in the proposed project's Need and Purpose (**Section I.A**), "two-way frontage roads need to be converted to one-way in order to provide safer highway operations at ramps and to conform to driver expectancy." The replacement of the diamond ramp configuration with an "X" ramp configuration would prevent traffic from stacking up on the ramps and main lanes. In addition, the "X" configuration results in motorists driving longer distances on the frontage roads, providing more traffic volume for the businesses adjacent to the roadway. Once drivers become accustomed to the new travel patterns, the increased mobility may offset concerns about converting to one-way frontage roads.

Community cohesion is a social attribute that indicates a shared sense of identity, common responsibility, and social interaction among people who live or work within a defined geographic area. It is the degree to which people have a sense of belonging to their neighborhood or community or a strong attachment to neighbors, groups, and institutions as a continual association over time. The residents of existing neighborhoods along IH 35 in the project area would not be denied access to other areas of the community; indeed, mobility would increase. The proposed improvements would not bisect any existing neighborhoods or isolate any neighborhood from community facilities. The proposed project would not open new areas to development and it is not anticipated that the project would induce changes in land use and development.

I.D.4.5 Airway-Highway Clearance

Because there are no airports in the vicinity of the proposed project, airway-highway clearance need not be obtained.

I.D.4.6 Utilities

In general, the proposed improvements would necessitate the relocation of some utilities such as underground oil and gas lines and overhead utilities prior to construction. The relocation and/or adjustment of utilities would be coordinated with the appropriate responsible entities prior to construction and would be accomplished with minimal impact to the public.

I.D.4.7 Public Facilities and Services

Two water wells would be affected by the proposed project. One is located at FM 2837 North, on the east side of IH 35, and the other is located on the west side of IH 35 near FM 2063. These are addressed in more detail in **Section I.D.4.11.b**. The McLennan County Precinct 1 storage area, located on the west side of IH 35 just south of FM 3148, would also be impacted.

I.D.4.8 Recorded Cemeteries

The project would not directly affect any previously recorded cemeteries.

I.D.4.9 Section 6(f) Properties

Section 6(f) of the Land and Water Conservation Fund Act requires that recreational facilities receiving U.S. Department of Interior funding from the Land and Water Conservation Fund Act as allocated by the Texas Parks and Wildlife Department (TPWD) may not be converted to non-recreational uses unless approval is received from TPWD and the National Park Service. There are no Section 6(f) resources in the project area.

I.D.4.10 Floodplains

The project corridor was investigated for encroachments into the 100-year floodplain. This information was obtained from the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps for McLennan County (map panels 4809280005B and 4804580001B). If the project would create an increase in the base flood elevation of one foot or more, or if it encroaches on a regulatory floodway, project engineers are required to notify all National Flood Insurance Program participants. According to maps produced by FEMA, McLennan County is a participant in the National Flood Insurance Program.

The proposed project alignment traverses the 100-year floodplain in several locations within the project limits. These floodplain areas are associated with Bull Hide Creek, Castleman Creek, and Chambers Creek as shown in **Appendix A**. Approximately 4.1 acres of existing and proposed right-of-way lie within the 100-year floodplain.

Executive Order 11988, "Floodplain Management," requires federal agencies to avoid actions, to the extent practicable, which result in the location of facilities in floodplains and/or affect floodplain values. The design of the proposed project would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances. The hydraulic design for this project would be in accordance with TxDOT and FHWA policies and standards. The proposed roadway facility would permit the conveyance of the 100-year flood, inundation of the roadway being acceptable, without causing significant damage to the roadway or other property.

I.D.4.11 Groundwater Resources

I.D.4.11.a Aquifers

One major aquifer, the Trinity Aquifer, and two minor aquifers, the Brazos River Alluvium Aquifer and the Woodbine Aquifer, underlie the project area.

The Trinity Aquifer provides water to 55 counties from the Red River to the Hill Country. More than half of the water pumped from the aquifer is for municipal uses, while one-third is used for irrigation. The aquifer is composed of Cretaceous period sand, clay and limestone. Recharge occurs through precipitation, surface streams and lakes in the outcrop area and through inter-formational leakage. Approximately 1.5 percent of the average annual

precipitation equals the annual effective recharge. Water quality in the aquifer is acceptable for most purposes, but in many areas the water pumped from the aquifer does not meet drinking water standards. Additionally, heavy pumping, water-level declines, leaking between formations and downdip contribute to deteriorating water quality. The project area lies over the downdip portion of the aquifer.

The Brazos River Alluvium Aquifer occurs in the floodplain and terrace deposit sediments of the Brazos River. The aquifer follows the course of the river and ranges from one to seven miles wide. Approximately 99 percent of the water pumped from this minor aquifer in 1994 was used for irrigation. Water quality in this aquifer is highly variable from drinkable to saline. Recharge occurs through precipitation on the floodplain.

The downdip of the Woodbine Aquifer occurs in conjunction with the northern portion of the project area. This aquifer extends from Hill County northward to Cooke County and eastward to Red River County. The Woodbine Aquifer is comprised of sand, sandstone, shale and clay. The lower part of the aquifer is utilized for well water. Pumped water is used for municipal, industrial and agricultural purposes. Water quality in this aquifer varies, but is considered good overall.

I.D.4.11.b Groundwater Effects

In order to assay possible impacts on groundwater, all available data from the "located well file" in the Central Records of the Texas Water Development Board (TWDB) were reviewed for the area along the project. Public supply water wells, both abandoned and in use, were found in the project area within 2,000 feet of the roadway centerline. To the east of IH 35 are two public supply water wells in use. On the west are four in use and two abandoned public supply wells. No recorded water wells are located within the proposed right-of-way; however, the proposed project would displace two public water wells (labeled as "Hewitt well") that were identified during field investigations. Wells identified during field investigations and obtained through data searches are displayed in **Appendix A**.

Construction-related activities have the potential to impact local groundwater. All measures should be taken to minimize effects to local groundwater. Consistent with the recommendation of the Texas Commission on Environmental Quality (TCEQ), TxDOT would ensure that, prior to initiation of construction, drill holes resulting from on-site core sampling and down-gradient water wells within the right-of-way would be plugged in order to protect local groundwater quality.

I.D.4.12 Geology and Soils Including Farmland Protection

I.D.4.12.a Geology

One geologic formation, Austin Chalk, is crossed by the study corridor. Austin Chalk was deposited during the upper Cretaceous period. It is composed of chalk and marl, which forms ledges. Austin Chalk consists of grayish-white to white microgranular calcite, alternating with medium gray marl. It ranges in thickness from 150 to 300 feet (UT-BEG 1970). The proposed project would not affect geologic resources.

I.D.4.12.b Soils

Soil is produced by a number of factors that act on geologic minerals. Soil characteristics are affected by physical and mineral composition of the parent material, climate, plant and animal life, topography, and time.

Table 12 lists the soil types found within the project area. Project area soils are generally clay or clay loam. Soils with high clay content tend to have low strength and a high shrink-swell potential. Soils in the project area are well suited for crop production and grazing.

Table 12 Soils Found in the Project Area		
NRCS Soil Series	Hydric	Prime Farmland
Austin silty clay, 1 to 3% slopes	No	Yes
Branyon clay, 0 to 1% slopes	No*	Yes
Eddy gravelly clay loam, 3 to 15% slopes	No	No
Eddy-Urban land complex, 3 to 15% slopes	No	No
Fairlie clay, 1 to 3% slopes	No*	Yes
Lewisville silty clay, 1 to 3% slopes	No	Yes
Ovan silty clay, frequently flooded	No	Yes
Stephen-Eddy complex, 2 to 5% slopes	No	No
Tinn, frequently flooded	No*	No
Venus clay loam, 1 to 3% slopes	No	Yes

*Soil may contain hydric inclusions.

Source: Natural Resource Conservation Service.1979. Soil Survey of McLennan County.

I.D.4.12.c Farmland Protection

The Farmland Protection Policy Act (FPPA), as detailed in Subtitle I of Title XV of the Agricultural and Food Act of 1981, provides protection to the following: (1) prime farmland; (2) unique farmland; and (3) farmland of local or statewide importance. The FPPA defines prime farmland as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management (irrigation), according to acceptable farming methods. Unique farmland is farmland that is used for production of specific high value food, feed, and fiber crops. Farmland of local or statewide importance is determined by the appropriate state or local government agency or agencies.

Approximately 96.3 acres of prime farmland soils occur within the project area. In accordance with the FPPA, a form AD-1006 has been completed for the proposed project (see **Appendix D**). The score was less than 160; therefore, coordination with the Natural Resources Conservation Service (NRCS) would not be required.

I.D.4.13 U.S. Coast Guard Permits

No U.S. Coast Guard permits are considered necessary for this project because it would cross no “navigable waters” as defined by Section 9 of the Rivers and Harbors Act.

I.D.4.14 Coastal Coordination

The proposed project is located in McLennan County, which is not a coastal county. The project is not under the jurisdiction of the Texas Coastal Management Program (TCMP); therefore, the project would not require coordination under the TCMP rules.

I.D.4.15 Essential Fish Habitat

No tidally influenced water bodies exist within the project area. Therefore, no essential fish habitat would be impacted by the proposed project.

I.D.4.16 Threatened and Endangered Species

Databases of sensitive species maintained by the U.S. Fish and Wildlife Service (USFWS) and the Texas Parks and Wildlife Department (TPWD) identified nine federally-listed threatened, endangered, or candidate species that may occur or have historically occurred in McLennan County, including six birds, two fishes, and one mammal species. Additionally five state-listed species that are not federally-listed (three birds and two reptiles) could potentially occur in McLennan County. **Table 13** presents the current status and anticipated impacts to each of those threatened or endangered species of potential occurrence within McLennan County. **Table 13** also lists species with no regulatory status that are considered rare in Texas and could occur within the county. Habitat requirements for most species in **Table 13** are described in the Texas Parks and Wildlife Department Annotated County Lists of Rare Species: McLennan County (**Appendix E**). Six species are potentially affected (see **Table 13** for effect determination.

A search of TPWD’s Natural Diversity Database (NDD) on August 31, 2006 revealed no occurrences of threatened or endangered species in the vicinity of the project.

Table 13 Threatened and Endangered Species of McLennan County, Texas						
COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS	HABITAT PRESENT?	EFFECT ON SPECIES	JUSTIFICATION OF EFFECT DETERMINATION*
BIRDS						
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	FDL	SE	No	No Effect	2
Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	FDL	ST	No	No Effect	2

Table 13 Threatened and Endangered Species of McLennan County, Texas						
COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	STATE STATUS	HABITAT PRESENT?	EFFECT ON SPECIES	JUSTIFICATION OF EFFECT DETERMINATION*
Bald Eagle	<i>Haliaeetus leucocephalus</i>	FDL	ST	No	No Effect	1
Black-capped Vireo	<i>Vireo atricapilla</i>	FE	-	No	No Effect	1
Golden-cheeked Warbler	<i>Dendroica chrysoparia</i>	FE	SE	No	No Effect	1
Henslow's Sparrow	<i>Ammodramus henslowii</i>	-	-	No	No Effect	1
Interior Least Tern	<i>Sterna antillarum athalassos</i>	FE	SE	No	No Effect	1
Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>	-	-	Yes	Potentially Affected	3 b, c
White-faced Ibis	<i>Plegadis chihi</i>	-	ST	No	No Effect	1
Whooping Crane	<i>Grus americana</i>	FE	SE	No	No Effect	2
Wood Stork	<i>Mycteria americana</i>	-	ST	No	No Effect	1
FISHES						
Guadalupe Bass	<i>Micropterus treculii</i>	-	-	Yes	Potentially Affected	3 b,c
Sharpnose Shiner	<i>Notropis oxyrhynchus</i>	FC	-	No	No Effect	1
Smalleye Shiner	<i>Notropis buccula</i>	FC	-	Yes	Potentially Affected	3 b,c
MAMMALS						
Cave Myotis Bat	<i>Myotis velifer</i>	-	-	No	No Effect	1
Plains Spotted Skunk	<i>Spilogale putorius interrupta</i>	-	-	Yes	Potentially Affected	3 b, c
Red wolf	<i>Canis rufus</i>	FE	SE	No	No Effect	4
MOLLUSKS						
False Spike Mussel	<i>Quincuncina mitchelli</i>	-	-	No	No Effect	1
Pistolgrip	<i>Tritogonia verrucosa</i>	-	-	No	No Effect	1
Rock-pocketbook	<i>Arcidens confragosus</i>	-	-	No	No Effect	1
Smooth Pimpleback	<i>Quadrula houstonensis</i>	-	-	No	No Effect	1
Texas Fawnsfoot	<i>Truncilla macrodon</i>	-	-	No	No Effect	1
REPTILES						
Texas Garter Snake	<i>Thamnophis sirtalis annectens</i>	-	-	Yes	Potentially Affected	3 b, c
Texas Horned Lizard	<i>Phrynosoma cornutum</i>	-	ST	No	No Effect	1
Timber/Canebrake Rattlesnake	<i>Crotalus horridus</i>	-	ST	Yes	Potentially Affected	3 b, c

Sources:

Texas Parks and Wildlife Department, Wildlife Division, Non-game and Rare Species and Habitat Assessment programs. 2007. County Lists of Texas' Special Species. McLennan County (last revised June 28, 2007). <http://gis.tpwd.state.tx.us/tpwEndangeredSpecies/DesktopDefault.aspx>, accessed July 6, 2007.

U.S. Fish and Wildlife Service. 2006. Endangered Species List. List of Species by County for Texas: McLennan County. <http://www.fws.gov/ifw2es/endangeredspecies/lists/ListSpecies.cfm>, accessed July 6, 2007.

Legend:

FE Federally-listed as Endangered
 FT Federally-listed as Threatened
 FC Federal Candidate for listing as threatened or endangered
 FDL Federally Delisted

PDL	Proposed for Delisting
SE	State-listed as Endangered
ST	State-listed as Threatened
"-"	Rare, but with no regulatory status

Justification of Effect Determination

1. The study area does not contain the preferred habitat for this species.
2. This species is migratory through the study area and would only potentially utilize the area for temporary stopover sites.
3. The study area may contain preferred habitat, but the project would not adversely impact the habitat due to one or more of the following reasons:
 - a. No preferred habitat would be removed.
 - b. No evidence of the species was observed during field investigations.
 - c. Project could directly impact individuals; however, this impact is not likely to affect regional populations.
4. This species is considered extirpated.

Federally-listed species and their habitats are protected under the Endangered Species Act. State-listed species are protected under TPWD regulations, which prohibit the taking, possession, transportation, or sale of individuals of the species without a permit to do so. Species considered rare by TPWD are not currently afforded any regulatory protections.

As shown in **Table 13**, six species are potentially affected by the proposed project. One of these, the shiner, is a federal candidate species; one, the timber/canebrake rattlesnake, is a state-listed species; and the remaining four species, the Western Burrowing Owl, Guadalupe bass, plains spotted skunk, and Texas garter snake, are considered rare by TPWD.

This project would have no effect on any federally-listed species, its habitat, or designated critical habitat, nor would it adversely impact any state-listed species, with the exception of the timber rattlesnake that has potential to occur in the area. Standard TxDOT Best Management Practices (BMPs) for erosion control and maintenance of stream quality should be sufficient to prevent excess turbidity and adverse impacts to water quality in the event that the federal candidate species, the shiner, would be present. During construction, water flow in stream would be maintained by use of the BMPs that would control erosion, post construction total suspended solids, and sedimentation control, as described in **Section III.D.3.3 Section 401 Compliance**.

1.D.4.17 Railroad Issues

No at-grade or new grade-separated railroad crossings occur within the project study area.

1.D.4.18 Section 4(f) Resources

Under Section 4(f) of the Department of Transportation Act (49 USC 303), the FHWA may not approve the use of land from a publicly owned park, recreational area, wildlife and waterfowl refuge lands, or significant historic sites of national, State, or local significance unless a determination is made that: 1) there is no feasible and prudent alternative; and 2) action includes all possible planning to minimize harm to the property resulting from use. No impacts to publicly owned parks, recreational areas, wildlife or waterfowl refuge lands would occur as a result of this project.

Evans Field, which was formerly used as a baseball field by Lorena High School, is located at the southwest corner of South FM 2837 and IH 35. Approximately 0.92 acre of additional right-of-way would be required from an undeveloped portion of Evans Field for the proposed project. The entire property of the former middle school and Evans Field has been purchased by a private property owner (Moran, 2007). Therefore, Evans Field is not subject to Section 4(f) regulations. No publicly-owned recreational facilities subject to Section 4(f) regulations are located in the proposed project area.

The Section 106 coordination process between TxDOT and THC concurred that there are no historic-age resources present that would be eligible for listing in the NRHP; therefore there are no historic properties present subject to 4(f) regulations in the project area.

I.E. APPLICABLE REGULATORY REQUIREMENTS

This document is prepared pursuant to the Council on Environmental Quality (CEQ) regulations (40 CFR 1502.13) for implementing the National Environmental Policy Act of 1969, as amended, using the Federal Highway Administration *Technical Advisory T6640.8A*, and the rules and procedures of TxDOT as outlined in the TxDOT Environmental Manual (2004).

The following regulatory requirements are pertinent to the proposed project. These regulations (and others) are addressed in this document.

- Endangered Species Act (16 USC 1531 et seq., P.L. 93-205)
- Migratory Bird Treaty Act of 1918
- Clean Water Act (CWA) of 1977 (33 U.S.C. s/s 1251 et seq.)
- Executive Order 11990 Protection of Wetlands
- Executive Order 11988 Floodplain Management
- National Pollution Discharge Elimination System (NPDES)/Texas Pollution Discharge Elimination System (TPDES)
- Executive Memorandum on Environmentally and Economically Beneficial Landscape Practices
- Executive Order 12898 on Environmental Justice
- Executive Order 13112 on Invasive Species
- Section 106 of the National Historic Preservation Act of 1966 (NHPA) as amended (16 USC 470, P.L. 95-515)
- Clean Air Act (CAA) of 1970 (42 U.S.C. s/s 9601 et seq.)
- Final Rule on controlling Emissions of Hazardous Air Pollutants from Mobile Survey (3/29/01)
- Uniform Relocation Assistance and Real Property Acquisitions Policies Act (42 U.S.C. 4601-4605, 4621-4633, 4635-4636, 4638, 4651-4655)
- Memoranda of Understanding between TxDOT and Texas Parks and Wildlife Department (TPWD)

- Memoranda of Understanding between TxDOT and Texas Commission on Environmental Quality (TCEQ)
- Programmatic Agreement between TxDOT and Texas Historical Commission

I.F. AGENCY COORDINATION

I.F.1 U.S. Fish and Wildlife Service (USFWS)

No effects on federally-listed species are anticipated. Because no federally-listed threatened and endangered species are known to occur in the project area, coordination with USFWS will not be required and no mitigation is proposed for any federally-listed species or habitat.

I.F.2 U.S. Army Corps of Engineers (USACE)

Impacts to waters of the U.S. associated with the construction of the proposed roadway would be permitted under Nationwide Permit (NWP) #14 – Linear Transportation Crossings. Based on the current design impacts to waters of the U.S. were calculated from the existing right-of-way to proposed right-of-way. No wetlands would be impacted. Permanent impacts to all waters of the U.S. within the project area would not exceed 0.10 acres at any single and complete crossing, and would not require coordination with the USACE.

A detention pond is proposed on the west side of IH 35, at the southwestern corner of the intersection of North FM 2837 and the IH 35 southbound frontage road to alleviate flooding problems along the Tributary to North Cow Bayou. At this time, the pond location is proposed but not finalized and specific design details are unavailable. As currently proposed, the pond could impact as much as approximately 399.8 linear feet of a small tributary to North Cow Bayou. NWP #43 Stormwater Management Facilities provides for the discharge of fill material into waters of the U.S. for construction and maintenance of stormwater management facilities, including excavation of the basin and installation and maintenance of water control structures, outfall structures, and spillways. NWP #43 requires Pre-Construction Notification (PCN) to the USACE. Criteria for compliance with NWP #43 includes a requirement that the discharge must not cause the loss of greater than one-half acre, including the loss of no more than 300 linear feet of stream bed. Any impacts to waters of the U.S. that would be greater than 0.5 acre or 300 linear feet would require an Individual Permit. When the pond is designed in more detail, potential impacts to jurisdictional waters in this area should be reassessed to determine which USACE permit would be required under Section 404.

I.F.3 Texas Commission on Environmental Quality (TCEQ)

Because more than five acres would be disturbed, this project meets the criteria for the Environmental Protection Agency (EPA)/TCEQ Texas Pollution Discharge Elimination (TPDES) General Permit. A stormwater pollution prevention plan (SW3P) would be prepared and a Notice of Intent (NOI) would be filed with the TCEQ.

I.F.4 Texas Parks and Wildlife Department (TPWD)

Coordination is required with TPWD because the project would have an impact on mature woody vegetation and riparian vegetation and is within the range and in suitable habitat of State-listed threatened or endangered species.

I.F.5 Texas Historical Commission (THC)

Formal coordination with the THC initiated by TxDOT-ENV Historical Studies Branch has been pursued regarding Section 106 of the National Historic Preservation Act, as amended for non-archeological properties greater than 50 years in age. According to the stipulations of the Programmatic Agreement (PA) among the Texas Historical Commission (THC), the Federal Highway Administration (FHWA), the Texas Department of Transportation (TxDOT), and the Advisory Council on Historic Preservation (ACHP), TxDOT-ENV Historical Studies Branch consulted with THC. Per TxDOT's Section 106 Notification of a Finding of No Effect letter dated July 13, 2004, a site visit of the project area conducted by TxDOT identified that there are eighteen historic-age resources (built prior to 1963) located within the project area of potential effects. TxDOT historians determined that none of the historic-age resources meet the criteria for listing in the NRHP. THC signed the concurrence letter on July 21, 2004 (see **Appendix D**). No further studies are necessary.

In the unlikely event that significant cultural resources are discovered during the undertaking's construction, TxDOT will immediately initiate cultural resource discovery procedures. All work in the vicinity will immediately cease until such time as a specialist from TxDOT and/or the THC can arrive on site and assess the discovery's significance as well as the potential need for additional investigation (if necessary).

I.F.6 Tribal Coordination

The FHWA is the lead Federal agency responsible for coordinating proposed transportation projects with sovereign tribal nations. TxDOT-ENV accomplishes tribal coordination on behalf of FHWA. The proposed project was coordinated with appropriate federally recognized Native American Tribes on July 26, 2001 with no concerns expressed. With the project continuing several years later, a TxDOT-ENV archeologist determined that, since no changes to the project had taken place since the original tribal coordination, it would not be necessary to revisit the tribal coordination.

I.F.7 TxDOT's Memoranda of Understanding (MOU) and Memoranda of Agreement (MOA)

Several MOUs and one MOA exist between TxDOT and State regulatory agencies. TxDOT would coordinate with these agencies to comply with all applicable regulations. MOUs exist between TxDOT and TPWD; TxDOT and THC; and TxDOT and TCEQ. An MOA exists between TxDOT and TPWD.

II. DESCRIPTION OF THE ALTERNATIVES

II.A. PROCESS USED TO DEVELOP PROJECT ALTERNATIVES

Alternatives analysis is the process by which the project design team evaluates alternatives for meeting the project's need and purpose. The analysis of alternatives for IH 35 improvements consisted of internal design team meetings, discussions with public officials, stakeholder meetings, and public meetings.

II.B. REQUIREMENTS FOR AND BENEFITS OF ALTERNATIVES

The screening criteria used to evaluate alternatives consisted of engineering/feasibility of construction, environmental effects, and ability to meet the stated need and purpose of the project (safety and mobility).

II.B.1 Principal Design Requirements

The principal design requirement is to widen the existing roadway from a two 12-foot lane undivided section, with six-foot inside and 10-foot outside shoulders to a three 12-foot lane undivided section with a concrete median barrier, with 10-foot inside shoulders and 10-foot outside shoulders within a typical right-of-way width of 468 feet (see **Figure 2**). From South FM 2837 to North 2837 through Lorena the typical right-of-way width would be 291 feet. Existing frontage roads consist of two 12-foot lanes and are bidirectional. The existing northbound frontage road between South FM 2837 and North FM 2837 is separated from the main lanes by a 57-foot wide (typical) median, and the southbound frontage road is separated from the main lanes by a 47-foot (typical) median.

From North FM 2837 to FM 2063, the existing northbound frontage road is separated from the main lanes by a 21-foot wide (typical) median, and the southbound frontage road is separated from the main lanes by a 30-foot wide (typical) median. The design requirement would be to widen the northbound and southbound frontage roads to consist of two 12-foot travel lanes, one four-foot inside shoulder, and one four-foot outside shoulder with curb and gutter along the outside shoulder (see **Figure 2**). Frontage roads would be one-way. Grassy medians would separate the main lanes from the frontage roads. The design speed of the proposed roadway would be 70 mph on IH 35 and 50 mph on the frontage roads. IH 35 is not designed to include bicycle lanes or pedestrian walkways.

The alignment of IH 35 at the South FM 2837 cross structure would be shifted to the south to improve the alignment at this intersection. The alignment at the North FM 2837 intersection cross-structure would be shifted to the north to improve the alignment at this intersection, and the alignment at the FM 3148 intersection would be kept as is to match adjacent improvements to FM 1695.

Throughout the project area, two-way frontage roads would be converted to one-way frontage roads. The ultimate ramp configurations would match existing diamond configurations. The difference between a diamond ramp configuration and an "X" configuration is that the diamond ramp is traditionally used where

traffic volumes are lighter (see **Figure 4**). The “X” configuration provides relief at intersections where greater traffic volumes are exiting the mainlanes. Providing a greater distance between the exit ramp and the intersection prevents traffic from stacking up on the ramps and mainlanes.

All bridges at interchanges (“cross-structure” bridges) would be replaced to raise the elevation to meet current clearance requirements for traffic traveling underneath the bridge. Where possible, culverts would be extended. The bridge over Bull Hide Creek and all culverts would likely be replaced due to age, condition, and loading requirements. Frontage road culverts with capacities less than adjacent mainlane culverts would be expanded to accommodate drainage from the main lane structures.

The Texas Transportation Commission has directed TxDOT to evaluate all controlled-access mobility projects, in any phase of development or construction, for tolling (Minute Order 109519). This includes new location roadways and projects that increase capacity by constructing or otherwise providing additional main lanes. TxDOT was also directed to evaluate the conversion of non-toll highways to toll. The proposed projects to add mainlanes along IH 35 through the Waco District were evaluated in 2004 for toll feasibility.

Although tolling the additional lanes on IH 35 was considered feasible, TxDOT administration decided not to toll the proposed additional lanes covered by this EA. This decision was made to allow IH 35 through the Waco District to be expanded from four lanes to six lanes to match portions of IH 35 that are not currently tolled south of the Williamson County line and north of Hill County.

However, any future expansion of IH 35 beyond the currently proposed six lanes could include toll lanes. If tolling were proposed in the future, TxDOT and FHWA would evaluate the impacts in a separate NEPA document and provide appropriate opportunities for public involvement.

II.B.2 Desired Design Benefits

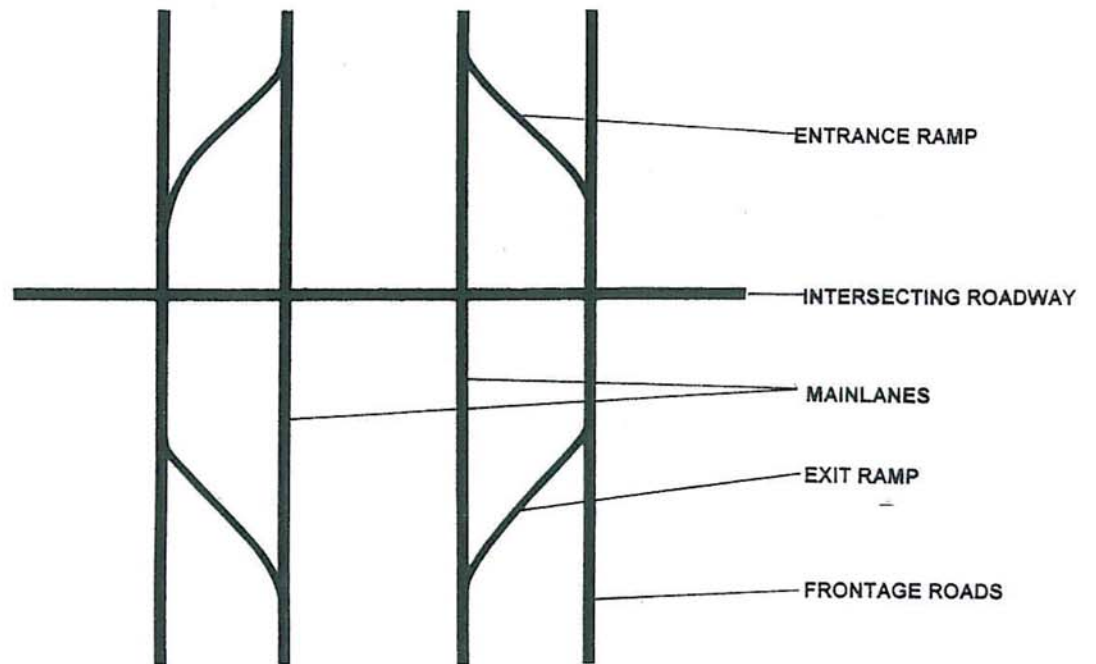
The purpose of this project is to improve existing pavement and structural conditions, provide additional capacity to meet future traffic demands, mitigate geometric deficiencies, and bring the highway into conformance with current design standards and criteria in order to improve safety for the traveling public on IH 35.

II.B.3 Environmental Protection and Enhancement Requirements

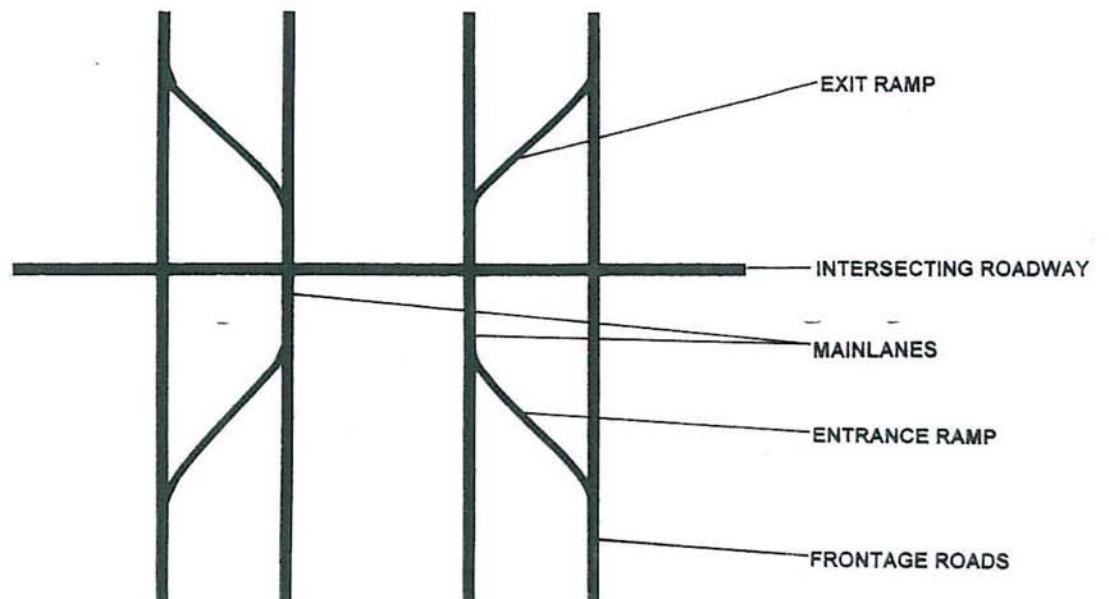
Several measures designed to either protect or enhance the environment are specifically included in the plans for the improvements to IH 35. These measures would be coordinated with the construction contractor through the use of permits and commitments. These measures are listed below and discussed in more detail in **Chapter III**.

- The contractor would use the temporary and permanent best management practices (BMPs) proposed to ensure water quality protection through the control of erosion, sedimentation, and post-construction total suspended solids (TSS) concentrations.

“ DIAMOND “ CONFIGURATION



“ X “ CONFIGURATION



RAMP PATTERNS

Figure 4

- The contractor would control invasive and alien vegetation by following the guidance and provisions of Executive Order 13112 on invasive species and the Executive Memorandum on Beneficial Landscape Practices.
- The contractor would observe proper maintenance and idling of construction equipment and sprinkling to control emissions of particulate matter.
- Construction staging would be scheduled to avoid unnecessary impacts to nests of migratory birds or migratory bird breeding seasons.
- The contractor would practice “good housekeeping” measures, as well as “grade management” techniques to help ensure that proper precautions are in place throughout construction of the proposed project.
- The use of construction equipment within stream channels would be minimized (or avoided). If work within a watercourse is unavoidable, heavy equipment shall be placed on mats, if necessary, to protect the substrate from gouging and rutting.
- All construction equipment and materials used within the stream channel and immediate vicinity would be removed as soon as the work schedule permits and/or when not in use, and they shall be stored in an area protected from storm water run-off.
- Provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

II.C ALTERNATIVES ELIMINATED FROM DETAILED STUDY

A total of six alternatives were considered for the proposed project. Four of the alternatives considered were eliminated from further study. These alternatives are described briefly below, along with the reasons they were eliminated from further study. Where potential residential relocations or business displacements would take place, the business is named and a note added if only right-of-way would be affected. The two alternatives carried forward for further analysis are discussed in **Section II.D**.

II.C.1 Alternative 1: East Option

Alternative 1 would require the acquisition of approximately 137.4 acres of new right-of-way. Of this, approximately 33 acres consists of developed land, and approximately 105 acres consists of cropland or undeveloped land. Four potential hazardous materials sites would be impacted by this proposed alternative (HM1-HM4). No historic properties were identified along this alternative, and this alternative would not impact any section 4(f)/6(f) properties. Approximately 0.038 acres of floodplains would be crossed by Alternative 1. This alternative would impact a total of approximately 0.20 acres of waters of the U.S. and no wetlands. All water crossings would be permitted under Nationwide Permit 14 and impacts to each water of the U.S. would fall below the 0.10 acre threshold for Pre-Construction Notification (PCN) to the U.S. Army Corps of Engineers (USACE). There are no recorded occurrences of state or federally listed threatened or endangered species in the project area, and no impacts would be anticipated as a result of construction of Alternative 1.

A total of three residential relocations would be required. Twenty-one (21) commercial businesses and two public facilities would be displaced by the implementation of this alternative. These relocations and displacements are discussed in more detail below. No environmental justice impacts would be anticipated.

From South FM 2837 to North FM 2837, one residential relocation and the displacement of one public facility, the McLennan County Tax Office, and 10 commercial businesses would be required. Affected businesses include Super Baytown Seafood Restaurant, Phillips 66, Sander's Jewelry, Aaron Tucker Insurance, Lorena Quick Lube, Ace Hardware, Lorena Diner and Deli, Connie's Car Wash, Extra Co. Banks, and one vacant commercial property.

From FM 2837 to FM 3148, one residence would require relocation; an orchard is associated with this residence. In addition, six commercial businesses would be displaced, including Johnson Transport, Pappa Joe's, Williams Drywall Co., Lorena Industrial Complex/Mid Tex Truck Repair, Interstate Homes, and Johnson Equipment/Auction Yard.

From FM 3148 to FM 2063, one residential relocation would be required; this residence does not appear to be occupied and is in a state of disrepair. Five commercial businesses would be displaced, including Steve Palmer Homes, Home Center of Waco, Bobcat of Waco, one radio tower, and one vacant commercial property. One public facility, a City of Hewitt Well, would be displaced.

This alignment received the greatest amount of public support at the January 2007 public meeting. Although this alternative generally meets the need and purpose of the proposed project, it does not meet the goal of avoiding or minimizing environmental impacts due to the large number of business impacts that would result (see **Table 14**), therefore, it was eliminated from further study.

II.C.2 Alternative 2A: West Option

Alternative 2A would require the acquisition of approximately 137.8 acres of new right-of-way. Of this, approximately 47 acres consists of developed land, and approximately 89 acres consists of cropland or undeveloped land. Nine potential hazardous materials sites would be impacted by this proposed alternative (HM12-HM20). No historic properties were identified along this alternative, and this alternative would not impact any section 4(f)/6(f) properties. Approximately 0.038 acres of floodplains would be crossed by Alternative 2A. This alternative would impact a total of approximately 0.21 acres of waters of the U.S. and no wetlands. All water crossings would be permitted under Nationwide Permit 14 and impacts to each water of the U.S. would fall below the 0.10 acre threshold for Pre-Construction Notification (PCN) to the U.S. Army Corps of Engineers (USACE). There are no recorded occurrences of state or federally listed threatened or endangered species in the project area, and no impacts would be anticipated as a result of construction of Alternative 2A.

Alternative 2A would result in more relocations and displacements than the other proposed alternatives. A total of seven residential relocations would be required. Forty-five (45) commercial businesses, three public facilities, and three community facilities would be displaced by the implementation of this

alternative. These relocations and displacements are discussed in more detail below. No environmental justice impacts would be anticipated.

From South FM 2837 to North FM 2837, five residential relocation and the displacement of three community facilities, First Baptist Church, a Lorena Police Department office, and the Lorena ISD Administration Building, as well as 11 commercial businesses would be required. Affected businesses include L&N Auto Sales, Chevron, Cook's Automotive, Bush's Chicken, Brew's Self Storage, Brookshire Brothers, Conoco, Tobacco Barn, and three vacant commercial properties. One former community facility that was recently purchased by a private property owner - Lorena Middle School and Evans Field - would also be impacted; however, it is currently unknown whether this property will be utilized for residential or commercial purposes.

From FM 2837 to FM 3148, one community facility, McLennan County Precinct 1, would be displaced.

From FM 3148 to FM 2063, two residential relocations, three public facilities, all City of Hewitt wells, and 34 commercial businesses would be displaced. Affected businesses include: Me Maw's Kitchen, Conoco, Lone Star Electronics, R.O. Peeples Drywall Installation, American Marble and Granite, American Engine, U.S. Tire, Larry's Color Pro, Texas Best Sprayers, UTEM Enterprises, UTEC, Fortenberry Insurance, The Vortex Inspections, Sprinklerman, Sweet Air Filters, Walkabout RV Sales/Service, Carla's Sign Shop, Trey's Fuel Injection, Golden Mobile Homes, Marilyn Davis Insurance, Horn Mobile Homes, LeLand's Storage Buildings, Wylie Sprayers, World Lift Truck, Alliance Distribution Inc., Ditch Witch Farm Equipment Company, American Sales, and Joe's Starter Shop, and six vacant commercial properties.

Although this alternative generally meets the need and purpose of the proposed project, it does not meet the goal of avoiding or minimizing environmental impacts due to the large number of business impacts that would result (see **Table 14**), therefore, it was eliminated from further study.

II.C.3 Alternative 2B: Compressed Option

Alternative 2B would require the acquisition of approximately 125.9 acres of new right-of-way. Of this, approximately 34 acres consists of developed land, and approximately 92 acres consists of cropland or undeveloped land. Four potential hazardous materials sites would be impacted by this proposed alternative (HM1, HM17, HM19-HM20). No historic properties were identified along this alternative, and this alternative would not impact any section 4(f)/6(f) properties. Approximately 0.039 acres of floodplains would be crossed by Alternative 2B. This alternative would impact a total of approximately 0.21 acres of waters of the U.S. and no wetlands. All water crossings would be permitted under Nationwide Permit 14 and impacts to each water of the U.S. would fall below the 0.10 acre threshold for Pre-Construction Notification (PCN) to the U.S. Army Corps of Engineers (USACE). There are no recorded occurrences of state or federally listed threatened or endangered species in the project area, and no impacts would be anticipated as a result of construction of Alternative 2B.

Alternative 2B would result in the second highest number of displacements among the proposed alternatives. A total of four residential relocations would be

required. Forty-one (41) commercial businesses, four public facilities, and two community facilities would be displaced by the implementation of this alternative. These relocations and displacements are discussed in more detail below. No environmental justice impacts would be anticipated.

From South FM 2837 to North FM 2837, two residential relocations and the displacement of six commercial businesses would be required. Affected businesses include L&N Auto Sales, Chevron, Cook's Automotive, Brew's Self Storage (right-of-way only), Brookshire Brothers (right-of-way only), and one vacant commercial property. Right-of-way would be taken from two community facilities, First Baptist Church and the Lorena ISD Administration Building.

From FM 2837 to FM 3148, one public facility, McLennan County Precinct 1, and one commercial business, Johnson Transport, would be displaced.

From FM 3148 to FM 2063, two residential relocations, three public facilities, all City of Hewitt wells, and 34 commercial businesses would be displaced. Affected businesses include: Me Maw's Kitchen, Conoco, Lone Star Electronics, R.O. Peeples Drywall Installation, American Marble and Granite, American Engine, U.S. Tire, Larry's Color Pro, Texas Best Sprayers, UTEM Enterprises, UTEC, Fortenberry Insurance, The Vortex Inspections, Sprinklerman, Sweet Air Filters, Walkabout RV Sales/Service, Carla's Sign Shop, Trey's Fuel Injection, Golden Mobile Homes, Marilyn Davis Insurance, Horn Mobile Homes, LeLand's Storage Buildings, Wylie Sprayers, World Lift Truck, Alliance Distribution Inc, Ditch Witch Farm Equipment Company, American Sales, and Joe's Starter Shop, and six vacant commercial properties.

Although this alternative generally meets the need and purpose of the proposed project, it does not meet the goal of avoiding or minimizing environmental impacts due to the large number of business impacts that would result (see **Table 14**), therefore, it was eliminated from further study.

II.C.4 Alternative 3: Alternating Option

Alternative 3 would require the acquisition of approximately 137.1 acres of new right-of-way. Of this, approximately 29 acres consists of developed land, and approximately 110 acres consists of cropland or undeveloped land. Three potential hazardous materials sites would be impacted by this proposed alternative (HM 1, HM3, HM17). No historic properties were identified along this alternative, and this alternative would not impact any section 4(f)/6(f) properties. Approximately 0.039 acres of floodplains would be crossed by Alternative 3. This alternative would impact a total of approximately 0.22 acres of waters of the U.S. and no wetlands. All water crossings would be permitted under Nationwide Permit 14 and impacts to each water of the U.S. would fall below the 0.10 acre threshold for Pre-Construction Notification (PCN) to the U.S. Army Corps of Engineers (USACE). There are no recorded occurrences of state or federally listed threatened or endangered species in the project area, and no impacts would be anticipated as a result of construction of Alternative 3.

A total of four residential relocations would be required. Twenty-one (21) commercial businesses, two public facilities, and one community facility would be displaced by the implementation of this alternative. These relocations and displacements are discussed in more detail below. No environmental justice impacts would be anticipated.

From South FM 2837 to North FM 2837, two residential relocations and the displacement of one community facility, the McLennan County Tax Office, and 10 commercial businesses would be required. Affected businesses include Super Baytown Seafood Restaurant, Phillips 66, Sander's Jewelry, Aaron Tucker Insurance, Lorena Quick Lube, Ace Hardware, Lorena Diner and Deli, Connie's Car Wash, Extra Co. Banks, and one vacant commercial property.

From FM 2837 to FM 3148, one residence would require relocation; an orchard is associated with this residence. In addition, one public facility, McLennan County Precinct 1 storage area, and four commercial businesses would be displaced, including Johnson Transport, Lorena Industrial Complex (right-of-way only), Interstate Homes, and Johnson Equipment/Auction Yard.

From FM 3148 to FM 2063, one residential relocation would be required; this residence does not appear to be occupied and is in a state of disrepair. Five commercial businesses would be displaced, including Steve Palmer Homes, Home Center of Waco, Bobcat of Waco, one radio tower, and one vacant commercial property. One public facility, a City of Hewitt Well, would also be displaced.

Although this alternative generally meets the need and purpose of the proposed project, it does not meet the goal of avoiding or minimizing environmental impacts due to the large number of business impacts that would result (see **Table 14**), therefore, it was eliminated from further study.

II.C.5

Summary of Relocations and Displacements by Alternative

Table 14 summarizes the relocations and displacements that would be required for each of the alternatives considered for the proposed project.

Table 14 Summary of Relocations and Displacements by Alternative						
Number of Relocations and Displacements	Alternatives					
	Eliminated from Consideration				Carried Forward	
	1 (East)	2A (West)	2B (Compressed)	3 (Alternating)	No Build	4 (Preferred)
Residential Relocations	3	7	4	4	0	1
Business Displacements	21	45	41	21	0	9
Public Facilities	3 (water well, McLennan County Precinct 1 storage area)	3 (all water wells)	4 (3 water wells, McLennan County Precinct 1 storage area)	2 (water well, McLennan County Precinct 1 storage area)	0	2 (1 water well, McLennan County Precinct 1 storage area)
Community Facilities	0	3 (First Baptist Church, Lorena Police Department office, Lorena ISD Administration Building)	2 (driveway impacts at First Baptist Church and Lorena ISD Administration Building)	1 (McLennan County Tax Office)	0	1 (driveway impacts at McLennan County Tax Office)

Table 15 summarizes impacts to businesses for each of the alternatives.

Table 15 Summary of Affected Businesses						
Business Name	Alternatives					
	Eliminated from Consideration				Carried Forward	
	1 (East)	2A (West)	2B (Compressed)	3 (Alternating)	No Build	4 (Preferred)
Super Baytown Seafood Restaurant	X			X		
Phillips 66	X			X		
Sander's Jewelry	X			X		X (driveway impacts only)
Aaron Tucker Insurance	X			X		X (driveway impacts only)
Lorena Quick Lube	X			X		X (driveway impacts only)
Ace Hardware	X			X		X (driveway impacts only)
Lorena Diner and Deli	X			X		X (driveway impacts only)
Connie's Car Wash	X			X		X (driveway impacts only)
Extra Co Banks	X			X		X (driveway impacts only)
Vacant Commercial	X (2)	X (9)	X (7)	X (2)		X (4- one with driveway impacts only)
Johnson Transport	X		X	X		
Pappa Joe's	X					
Williams Drywall Co	X					
Lorena Industrial Complex/Mix Tex Truck Repair	X			X (driveway impacts only)		
Interstate Homes	X			X		X (driveway impacts only)
Johnson Equipment/Auction Yard	X			X		X
Steve Palmer Homes	X			X		X
Home Center of Waco	X			X		X
Bobcat of Waco	X			X		X
Radio Tower	X			X		X
L&N Auto Sales		X	X			
Chevron		X	X			
Cook's Automotive		X	X			
Bush's Chicken		X				
Brew's Self Storage		X	X (driveway impacts only)			
Brookshire Brothers		X	X (driveway impacts only)			
Conoco		X				
Tobacco Barn		X				

Table 15 Summary of Affected Businesses						
Business Name	Alternatives					
	Eliminated from Consideration				Carried Forward	
	1 (East)	2A (West)	2B (Compressed)	3 (Alternating)	No Build	4 (Preferred)
Former Lorena Middle School/Evans Field		X				
Me Maw's Kitchen		X	X			
Conoco		X	X			
Lone Star Electronics		X	X			
R.O. Peebles Drywall Installation		X	X			
American Marble and Granite		X	X			
American Engine		X	X			
U.S. Tire		X	X			
Larry's Color Pro		X	X			
Texas Best Sprayers		X	X			
UTEM Enterprises		X	X			
UTEC		X	X			
Fortenberry Insurance		X	X			
The Vortex InspectionsX		X	X			
Sprinklerman		X	X			
Sweet Air Filters		X	X			
Walkabout RV Sales/Service		X	X			
Carla's Sign Shop		X	X			
Trey's Fuel Injection		X	X			
Golden Mobile Homes		X	X			
Marilyn Davis Insurance		X	X			
Horn Mobile Homes		X	X			
LeLand's Storage Buildings		X	X			
Wylie Sprayers		X	X			
World Lift Truck		X	X			
Alliance Distribution Inc.		X	X			
Ditch Witch Farm Equipment Company		X	X			
American Sales		X	X			
Joe's Starter Shop		X	X			

II.D DETAILED DESCRIPTION OF REASONABLE ALTERNATIVES

Two alternatives were considered and carried forward for further analysis.

II.D.1 The No Build Alternative

The No Build Alternative means that the existing IH 35 would remain generally in its existing condition with some minor rehabilitation and maintenance. The No Build Alternative would not require the conversion of approximately 134.3 acres from existing land uses to roadway right-of-way. This alternative would

not require the expenditure of approximately \$121,853,527 of public funds for construction. However, the No Build Alternative would not result in improved safety and traffic congestion relief, nor would it improve roadway conditions or replace outdated design elements. In fact, selection of the No Build Alternative would result in worsening roadway conditions and traffic congestion. Although it does not meet the purpose and need of the proposed project, the No Build Alternative will be carried forth for comparison purposes.

II.D.2 **Alternative 4: Preferred Alternative**

Following the public meeting, adjustments were made to the proposed alignments, resulting in a Preferred Alternative which is a combination of the alternatives presented in **Section II.C Alternatives Eliminated from Further Study**. From South FM 2837 to North FM 2837 the Preferred Alternative is synonymous with the compressed option, from North FM 2837 to FM 3148 it is a shift to the west, and from FM 3148 to FM 2063 it is a shift to the east.

Alternative 4 would require the acquisition of approximately 134.3 acres of new right-of-way. Of this, approximately 20.5 acres consists of developed land, and approximately 104.6 acres consists of cropland or undeveloped land. Two potential hazardous materials sites would be impacted by this proposed alternative. No historic properties were identified along this alternative, and this alternative would not impact any section 4(f)/6(f) properties. Approximately 4.1 acres of floodplains would be crossed by Alternative 4. There are no recorded occurrences of state or federally listed threatened or endangered species in the project area, and no impacts would be anticipated as a result of construction of Alternative 4.

This alternative would impact a total of approximately 0.1 acres of waters of the U.S. and no wetlands. Impacts to each single and complete water crossing as a result of construction of the roadway would be permitted under Nationwide Permit (NWP) 14 and impacts to each water of the U.S. would fall below the 0.10 acre threshold for Pre-Construction Notification (PCN) to the U.S. Army Corps of Engineers (USACE). In June 2007 the design was adjusted to include a proposed detention pond at the southwest corner of the intersection of IH 35 and North FM 2837. The construction of the detention pond would impact the Tributary to North Cow Bayou. Construction of the pond would be permitted under NWP 43 if impacts remain below the 0.5 acre/300 linear feet threshold. If impacts were to exceed the threshold, an Individual Permit would be required. At this time specific design information for the pond is not available. Once the design is complete, impacts to the Tributary to North Cow Bayou would be reassessed to determine the appropriate permit under Section 404.

Alternative 4 would require fewer relocations and displacements than any of the alternatives described in **Section II.C**. A total of one residential relocation and eight commercial displacements would be required. Two public facilities, including one water well and a county storage area would be displaced. These relocations and displacements are discussed in more detail below. No environmental justice impacts would be anticipated.

From South FM 2837 to North FM 2837, no relocations or displacements would be required, although several businesses and one community facility in a strip center along the east side of IH 35 would experience some minor driveway impacts. Driveway impacts would occur at Sander's Jewelry, Aaron Tucker

Insurance, Quick Lube, Ace Hardware, McLennan County Tax Office, Lorena Diner and Deli, Vacant Commercial, Connie's Carwash, and Extra Co Bank.

From FM 2837 to FM 3148, two public facilities and three businesses would be displaced. Affected public facilities include one water well and the McLennan County Precinct 1 storage area. Business displacements include, Johnson Equipment Auction Yard and one vacant commercial property. Driveway impacts would occur at Interstate Homes.

From FM 3148 to FM 2063, one residential relocation, and six business displacements would be required. The residence to be relocated appears to be unoccupied and dilapidated. Six commercial businesses would be displaced, including Steve Palmer Homes, Home Center of Waco, Bobcat of Waco, a radio tower, and two vacant commercial properties.

II.D.3 Selection of the Preferred Alternative

Based on a review of the impacts of the various alternatives and public involvement, Alternative 4 was selected as the recommended Preferred Alternative. This alternative best meets the need and purpose of the project while avoiding, minimizing, and mitigating environmental impacts. Detailed impacts are described in **Chapter III**.

In general, the proposed improvements would necessitate the relocation of some utilities such as subterranean oil and gas lines and aerial utilities prior to construction. The relocation and/or adjustment of utilities in conflict would be coordinated with the appropriate responsible entities prior to construction and would be accomplished with minimal impact to the public.

Work would be phased in a manner that would allow two lanes to remain open in each direction during construction. There could be times when the closure of one of these lanes would be required, but this would occur outside of peak traffic hours or on a daily basis as needed. No extended ramp closures are anticipated during construction. Should ramp closures be required, temporary ramps would be constructed in the vicinity of the existing ramps to provide access to adjacent properties.

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section explains the potential impacts the alternatives under consideration would have on relevant issues as identified in **Section I.D.3**. Relevant issues evaluated in this chapter include:

- Traffic noise
- Air Quality
- Wildlife and vegetation
- Water resources (including waters of the U.S. and wetlands)
- Relocations and right-of-way (including land use)
- Hazardous materials
- Archeology
- Historic resources
- Indirect and cumulative impacts

III.A. TRAFFIC NOISE

III.A.1 Existing Conditions

This analysis was accomplished in accordance with TxDOT's (FHWA approved) Guidelines for Analysis and Abatement of Highway Traffic Noise.

Sound from highway traffic is generated primarily from a vehicle's tires, engine and exhaust. It is commonly measured in decibels and is expressed as "dB."

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dBA."

Also, because traffic sound levels are never constant due to the changing number, type and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "Leq."

The traffic noise analysis typically includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise.
- Determination of existing noise levels.
- Prediction of future noise levels.
- Identification of possible noise impacts.
- Consideration and evaluation of measures to reduce noise impacts.

The FHWA has established the following Noise Abatement Criteria (NAC) for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur (**Table 16**):

Table 16 FHWA Noise Abatement Criteria		
Activity Category	dBA Leq	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extra-ordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals.
C	72 (exterior)	Developed lands, properties or activities not included in categories A or B above.
D	--	Undeveloped lands.
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

NOTE: Primary consideration is given to exterior areas (Category A, B or C) where frequent human activity occurs. However, interior areas (Category E) are used if exterior areas are physically shielded from the roadway, or if there is little or no human activity in exterior areas adjacent to the roadway.

A noise impact occurs when either the absolute or relative criterion is met:

Absolute criterion: the predicted noise level at a receiver approaches, equals or exceeds the NAC. "Approach" is defined as one dBA below the NAC. For example: a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dBA or above.

Relative criterion: the predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal or exceed the NAC. "Substantially exceeds" is defined as more than 10 dBA. For example: a noise impact would occur at a Category B residence if the existing level is 54 dBA and the predicted level is 65 dBA (11 dBA increase).

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area.

III.A.2 Environmental Consequences of the No Build Alternative

The No Build Alternative would result in gradually increasing noise as traffic congestion continues to grow in the project area.

III.A.3 Environmental Consequences of the Preferred Alternative

The FHWA traffic noise modeling software was used to calculate existing and predicted traffic noise levels. The model primarily considers the number, type and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

Existing and predicted traffic noise levels were determined at receiver locations (**Table 17 and Appendix A –Plates 1-1 through 1-5**) that represent the land use activity areas adjacent to the proposed project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement.

Table 17 Traffic Noise Levels (dBA Leq)						
Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2030	Change (+/-)	Noise Impact
R1 Residence	B	67	64	72	+8	Yes
R2 Apartments	E	52	43	45	+2	No
R3 Apartments	E	52	44	45	+1	No
R4 Residence	B	67	63	63	0	No
R5 Residence	B	67	61	64	+3	No
R6 Residence	B	67	72	71	-1	Yes

As indicated in **Table 17**, the proposed project would result in traffic noise impacts and the following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone and the construction of noise barriers.

Before any abatement measure can be proposed for incorporation into the project, it must be both feasible and reasonable. In order to be "feasible," the abatement measure must be able to reduce the noise level at an impacted receiver by at least five dBA; and to be "reasonable," it must not exceed the cost-effectiveness criterion of \$25,000 for each receiver that would benefit by a reduction of at least five dBA.

Traffic management: controls could be used to reduce the speed of the traffic; however, the minor benefit of one dBA per five mph reduction in speed does not outweigh the associated increase in congestion and air pollution. Other measures such as time or use restrictions for certain vehicles are prohibited on state highways.

Alteration of horizontal and/or vertical alignments: any further alteration of the alignment would displace existing businesses and residences, require additional right of way and not be cost effective/reasonable.

Buffer zone: the acquisition of undeveloped property to act as a buffer zone is designed to avoid rather than abate traffic noise impacts and, therefore, is not feasible.

Noise barriers: this is the most commonly used noise abatement measure. Noise barriers were evaluated for each of the impacted receiver locations with the following results:

R1 and R6: these receivers represent separate, individual residences. Noise barriers that would achieve the minimum feasible reduction of 5 dBA at each of these receivers would exceed the reasonable, cost-effectiveness criterion of \$25,000.

None of the above noise abatement measures would be both feasible and reasonable; therefore, no abatement measures are proposed for this project.

To avoid noise impacts that may result from future development of properties adjacent to the proposed project, local officials responsible for land use control programs should ensure, to the maximum extent possible, that no new activities are planned or constructed along or within the following (**Table 18**) predicted (2030) noise impact contour.

Table 18 Year 2030 Predicted Noise Impact Contours			
UNDEVELOPED AREA	LAND USE	IMPACT CONTOUR	DISTANCE FROM RIGHT-OF-WAY
IH 35	Residential	66 dBA	310 feet

Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. None of the receivers are expected to be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities is not expected. Provisions will be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

A copy of this traffic noise analysis will be made available to local officials. On the date of approval of this document (Date of Public Knowledge), FHWA and TxDOT are no longer responsible for providing noise abatement for new development adjacent to the project.

III.B. AIR QUALITY

III.B.1 Existing Conditions

The project is located in McLennan County, which is in an area in attainment of all National Ambient Air Quality Standards (NAAQS); therefore, the transportation conformity rules do not apply.

The proposed action is consistent with Connections 2030 – The Waco Metropolitan Transportation Plan and the 2008-2011 Statewide Transportation Improvement Program (STIP). Combined mainlane and frontage road traffic data for the design year (2029) is a maximum of 102,000 vehicles per day. These traffic projections do not exceed 140,000 vehicles per day; therefore, this project is exempt from a Traffic Air Quality Analysis because previous analyses of similar projects did not result in a violation of the NAAQS.

III.B.2 Environmental Consequences of the No Build Alternative

The No Build Alternative would result in gradually increasing air emissions as traffic volumes increase and traffic congestion continues to worsen within the project area.

III.B.3 Environmental Consequences of the Preferred Alternative

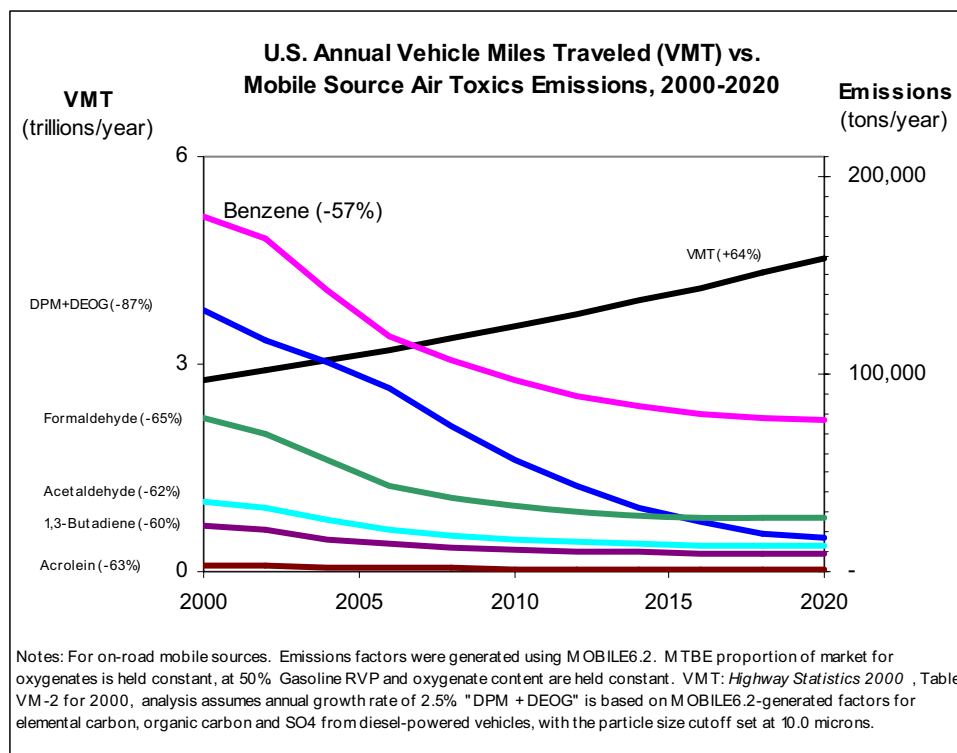
1. Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources (e.g., cars), non-road mobile sources (e.g.,

airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act (CAA) and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs would reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and would reduce on-highway diesel particulate matter (PM) emissions by 87 percent, as shown in the following graph:



In an ongoing review of MSATs, the EPA finalized additional rules under authority of CAA Section 202(1) to further reduce MSAT emissions that are not

reflected in the above graph. The EPA issued Final Rules on Control of Hazardous Air Pollutants from Mobile Sources (72 FR 8427, February 26, 2007) under Title 40 Code of Federal Regulations Parts 59, 80, 85, and 86. The rule changes were effective April 27, 2007. As a result of this review, EPA adopted the following new requirements to significantly lower emissions of benzene and the other MSATs by: (1) lowering the benzene content in gasoline; (2) reducing non-methane hydrocarbon (NMHC) exhaust emissions from passenger vehicles operated at cold temperatures (under 75 degrees Fahrenheit); and (3) reducing evaporative emissions that permeate through portable fuel containers.

Beginning in 2011, the petroleum refiners must meet an annual average gasoline benzene content standard of 0.62 percent by volume, for both reformulated and conventional gasolines, nationwide. The national benzene content of gasoline in 2007 is about 1.0 percent by volume. EPA standards to reduce NMHC exhaust emissions from new gasoline-fueled vehicles will become effective in phases. Standards for light-duty vehicles and trucks (less than or equal to 6,000 pounds [lbs]) become effective during the period of 2010 to 2013, and standards for heavy light-duty trucks (6,000 to 8,000 lbs) and medium-duty passenger vehicles (up to 10,000 lbs) become effective during the period of 2012 to 2015. Evaporative requirements for portable gas containers become effective with containers manufactured in 2009. Evaporative emissions must be limited to 0.3 grams of hydrocarbons per gallon per day.

EPA has also adopted more stringent evaporative emission standards (equivalent to current California standards) for new passenger vehicles. The new standards become effective in 2009 for light vehicles and in 2010 for heavy vehicles. In addition to the reductions from the 2001 rule, the new rules will significantly reduce annual national MSAT emissions. For example, EPA estimates that emissions in the year 2030, when compared to emissions in the base year prior to the rule, will show a reduction of 330,000 tons of MSATs (including 61,000 tons of benzene), reductions of more than 1,000,000 tons of volatile organic compounds, and reductions of more than 19,000 tons of PM 2.5.

Numerous technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project (see “Unavailable Information for Project Specific MSAT Impact Analysis” at the end of this section for more information). However, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative assessment cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA, entitled “A Methodology for Evaluating Mobile Air Toxic Emissions among Transportation Project Alternatives”, found at:

www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm.

The maximum Average Annual Daily Traffic (AADT) for the proposed IH 35 Environmental Assessment (EA) is 102,000 vehicles per day. For each alternative in this EA, the amount of MSATs emitted would be proportional to the vehicle miles traveled (VMT) assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the Build Alternatives is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted

trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along nearby routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Because the estimated VMT under each of the Build Alternatives is nearly the same it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes and businesses; therefore, there may be localized areas where ambient concentrations of MSATs could be higher under the preferred Build Alternative than under the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the improved roadway sections within the communities of Lorena and Hewitt based on higher traffic projections within those segments of IH35. However, as discussed previously, the magnitude and the duration of these potential increases compared to the No Build Alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations coupled with fleet turnover will cause region-wide MSAT levels to be significantly lower than today in almost all cases.

Sensitive Receptor Assessment

An assessment of potential sensitive receptors within 100 meters (328 feet) and 500 meters (1,640 feet) has been conducted for the expanded IH 35 roadway project. The distances shown are based on TxDOT and EPA air quality guidance, which states that dispersion studies have shown that roadway air toxics start to drop off at about 100 meters. By 500 meters, most studies have found it very difficult to distinguish the roadway from background toxic concentrations in any given area. Sensitive receptors include those facilities most likely to contain large concentrations of the more sensitive population (hospitals, schools, licensed day cares, and elder care facilities). A sensitive receptor assessment was conducted within the project corridor on June 6, 2007. The following tables (**Tables 19 and 20**) show the number of sensitive receptors identified within 100 and 500 meters of the project area and the specific location

of each receptor identified. One sensitive receptor (SR1 – Lorena United Methodist Child Care Center) was identified within 500 meters of the IH 35 project. The sensitive receptor location is graphically depicted on **Plates 1-1 through 1-5 in Appendix A.**

Table 19 Sensitive Receptors by Distance			
Alternative	Length (miles)	Number of Receptors within:	
		328 ft (100 meters)	1640 ft (500 meters)
Preferred	5.85	0	1

Table 20 Sensitive Receptors in the Project Area				
ID	Name	Address	City	Zip Code
SR1	Lorena United Methodist Child Care	299 S Bordan Street	Lorena	76655

Unavailable Information for Project Specific MSAT Impact Analysis: This EA includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable prediction of the project-specific health impacts of the emission changes associated with this proposed action. Because of these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Information that is Unavailable or Incomplete: Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

1. Emissions: The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter (PM), the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE 6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE 6.2 is an adequate tool for projecting emissions

trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

2. Dispersion: The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also would focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.
3. Exposure Levels and Health Effects: Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

2. Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs

Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level.

While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at <http://www.epa.gov/iris>. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.
- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- **Diesel exhaust (DE)** is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases. Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable the performance of a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information

While available tools do allow for reasonably predicting relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

In this document, a qualitative assessment has been provided relative to the various alternatives of MSAT emissions and has acknowledged that the project may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

III.C. WILDLIFE AND VEGETATION

III.C.1 Existing Conditions

III.C.1.1 Vegetation

III.C.1.1.a Vegetation Types

The project area occurs on the border between the Blackland Prairies and Cross Timbers and Prairies regions of Texas (Gould et al. 1960) (see **Figure 5**). According to "The Vegetation Types of Texas" (McMahan et al. 1984), the main vegetation type of this region is Crops.

The Crops vegetation type is found throughout the state in the Rolling Plains, High Plains, Blackland Prairies, and Gulf Prairies and Marshes. Plants typically associated with this vegetation type include cultivated cover crops or row crops providing food and/or fiber for either man or domestic animals. This type may also include grasslands associated with crop rotations.

III.C.1.1.b Project Area Vegetation

In accordance with Provision (4)(A)(i) of the TxDOT - TPWD Memorandum of Understanding (MOU) and Memorandum of Agreement (MOA), an investigation was conducted to identify and map the vegetation types present in the project area and assess the potential effects of the proposed project on native vegetation.

Vegetative communities within the project area consist of mixed hardwood woodlands, juniper shrubland, riparian woodland, pecan orchard, grazing land, and cropland (see **Appendix A – Plates 2-1 through 2-5**). General descriptions for each of these vegetative communities are found in the following paragraphs.

Mixed Hardwood Woodlands

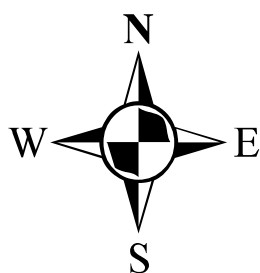
Woodlands described here include woody vegetation with an overstory nine to 30 feet tall with a closed crown or nearly so (50 to 100 percent canopy cover). The dominant woody species within the mixed hardwood woodlands are cedar elm (*Ulmus crassifolia*), American elm (*Ulmus americana*), hackberry (*Celtis laevigata*), mesquite (*Prosopis glandulosa*) and Ashe juniper (*Juniperus ashei*). These areas also include substantial amounts of gum bumelia (*Bumelia lanuginosa*), live oak (*Quercus virginiana*), pecan (*Carya illinoensis*), green ash (*Fraxinus pennsylvanica*), chinaberry (*Melia azedarach*), and Osage-orange (*Maclura pomifera*). The understory within this community includes Texas sophora (*Sophora affinis*), giant ragweed (*Ambrosia trifida*), yucca (*Yucca* spp.), prickly pear (*Opuntia* spp.), crotons (*Croton* spp.), little bluestem (*Schizachyrium scoparium*), silver bluestem (*Bothriochloa laguroides*), rescuegrass (*Bromus unioloides*), sideoats grama (*Bouteloua curtipendula*), wood oats (*Chasmanthium latifolium*), goldenrod (*Solidago* spp.), saw greenbrier (*Smilax bona-nox*), Virginia creeper (*Parthenocissus quinquefolia*), and poison ivy (*Toxicodendron radicans*). Tree Diameters at Breast Height (DBH) within this community are as follows: cedar elm – four to 17 inches; American elm – four to 23 inches; hackberry – four to 28 inches; mesquite – one to 10 inches; and Ashe juniper – four to 13 inches. This vegetative area accounts for less than one percent (0.16 acre) of the total project area.

Juniper Shrublands

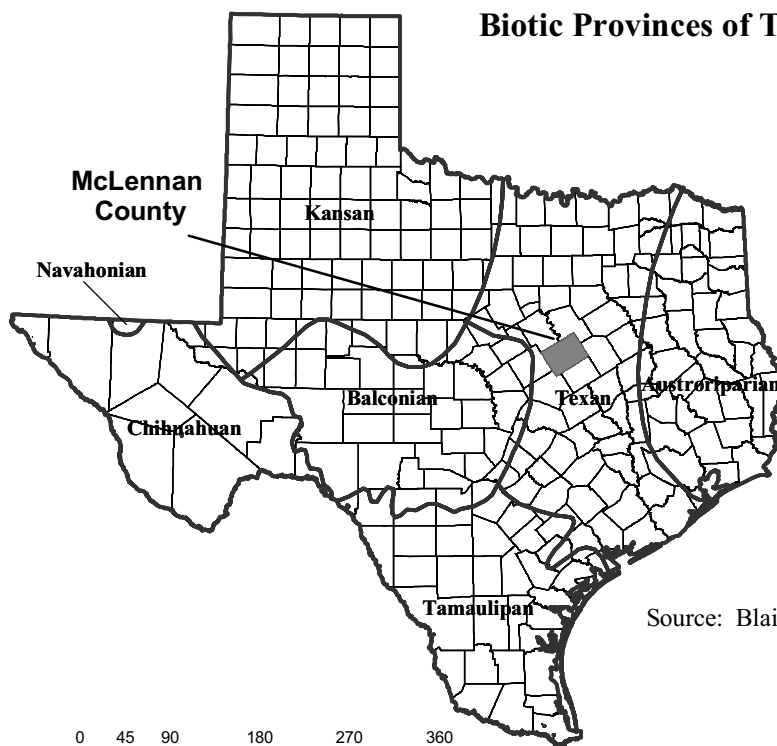
Juniper shrubland communities found adjacent to the study area are dominated by Ashe juniper, prickly pear and various native grasses as described for grazing land. Average height for Ashe juniper ranges from one to fifteen feet tall (mean approximately eight feet) with a spatial coverage ranging from approximately 5-25 percent. Average DBH is less than four inches. Trees are primarily regrowth from selective removal or encroachment within over-grazed pastures. Other invader species found within this vegetative category and along fencelines include hackberry and gum bumelia with a DBH range of four to 15 inches. This vegetative area would not be impacted by the proposed project.

Riparian Woodlands

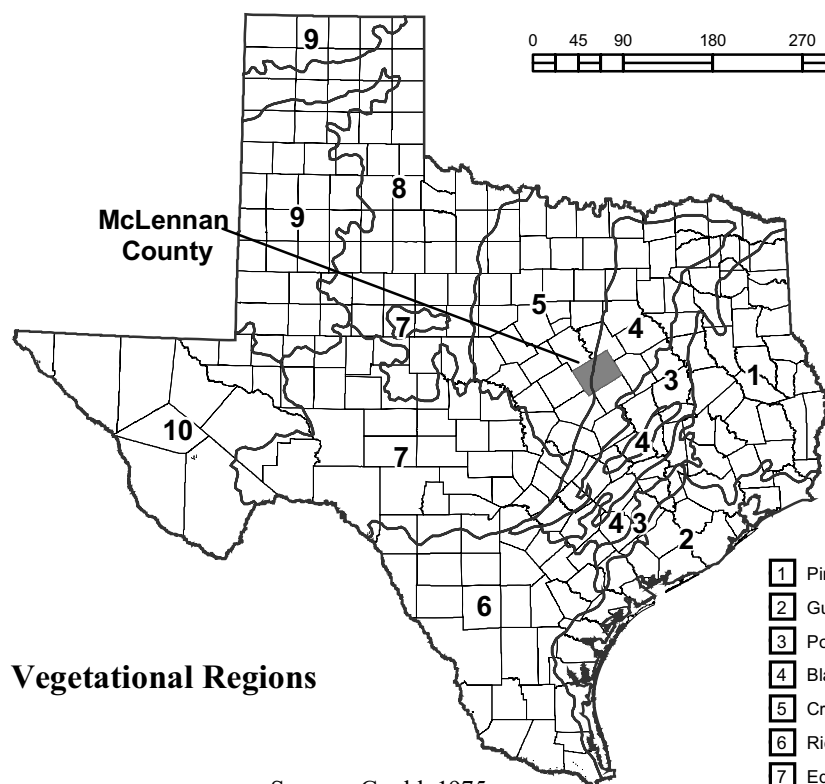
The project area contains several crossings of creeks and drainages. The vegetation found within the riparian zones associated with these crossings includes black willow (*Salix nigra*), hackberry, mesquite, cedar elm, gum bumelia, chinaberry, roughleaf dogwood (*Cornus drummondii*), common cat-tail (*Typha latifolia*), giant reed (*Arundo donax*), curly-leaf dock (*Rumex crispus*), Virginia creeper, poison ivy, saw greenbrier, dewberry (*Rubus trivialis*), Virginia wildrye (*Elymus virginicus*), rescuegrass (*Bromus catharticus*), bermudagrass (*Cynodon dactylon*), Johnsongrass (*Sorghum halepense*), white tridens (*Tridens albescens*) and giant ragweed. Canopy height within the riparian woodland ranges from five to 25 feet, with a canopy coverage of ten to 90 percent. Average tree diameters within this vegetative area are approximately four to 12 inches. Two large trees, each with a dbh over 30 inches, were noted during field investigations. This vegetative area accounts for approximately 2.4 percent (3.0 acres) of the total project area.



Biotic Provinces of Texas



Source: Blair, 1950



Vegetational Regions

Source: Gould, 1975

Vegetational Areas

- 1 Pineywoods
- 2 Gulf Prairies and Marshes
- 3 Post Oak Savannah
- 4 Blackland Prairies
- 5 Cross Timbers and Prairies
- 6 Rio Grande/South Texas Plains
- 7 Edwards Plateau
- 8 Rolling Plains
- 9 High Plains
- 10 Trans-Pecos, Mountains, and Basins

Vegetational Regions and Biotic Provinces of Texas

Figure 5

Pecan Orchard

The pecan orchard is adjacent to the project area and consists of approximately 60 to 80 pecan trees with a few fruit trees and other miscellaneous trees. DBH varies from approximately three to 13 inches. This vegetative area would not be impacted by the proposed project.

Grazing Land

Areas designated as grazing land are dominated by grassland communities. These include oldfields and improved pastures. This vegetative area accounts for approximately 75.9 percent (94.9 acres) of the total project area.

Oldfields are abandoned fields or croplands which have or are going through successional changes. Some of these areas contain invasive woody species which make up less than 10 percent coverage. Most of these areas are dominated by native grasses and are made up of a range of flora including mesquite, hackberry, juniper, pecan, cedar elm, gum bumelia, common sunflower (*Helianthus* spp.), goldenrod (*Solidago* spp.), crotons, silver bluestem (*Bothriochloa laguroides*), little bluestem, rescuegrass (*Bromus unioloides*), white tridens (*Tridens albescens*), snow-on-the-prairie (*Euphorbia bicolor*), and oldfield threeawn (*Aristida oligantha*).

Improved pastures are communities which are primarily herbaceous cover with less than 10 percent being woody vegetation. Within the study area these areas are primarily used for farm and ranch purposes such as hayfields and grazing for livestock. The vegetative community is primarily made up of introduced grasses and invasive forbs such as bermudagrass (*Cynodon dactylon*), bahiagrass (*Paspalum notatum*), crotons, silverleaf nightshade (*Solanum elaeagnifolium*), and ragweed. Fencelines within this community are normally dominated by invasive species such as hackberry, gum bumelia, and mesquite. The DBH range for these species is four to 15 inches.

Cropland

Croplands are cultivated areas which were found to be fallow at the time of the field investigation or were planted in agricultural crops. Crops present during field visits include corn (*Zea mays*), cotton (*Gossypium hirsutum*), and sorghum (*Sorghum bicolor*). Invader species of this community consist of hackberry, mesquite, and gum bumelia along fencelines or in areas which are inaccessible for plowing. Average DBH for tree species along fencelines ranged from four to 13 inches. This vegetative area accounts for approximately 4.8 percent (6.0 acres) of the total project area.

Developed Land

The remaining 16.4 percent (20.5 acres) of the project area is composed of developed land uses. Mature trees and other woody vegetation may be present in association with residential and commercial properties.

Remnant Prairie Communities

No remnant prairie communities were identified within the study area. According to the Natural Diversity Database (NDD) maintained by Texas Parks and Wildlife Department (TPWD), tracts containing the Little Bluestem-

Indiangrass Series are found beyond a seven mile perimeter in areas northeast and southwest of the project area. This broadly defined upland tallgrass community once occurred throughout the Blackland, Fayette, and Grand Prairies, but is now restricted to small, isolated relicts.

III.C.1.2 Wildlife

III.C.1.2.a Biotic Provinces

The proposed project area occurs within the Texan biotic province, as described by Blair (1950) (see **Figure 5**). The Texan biotic province occurs in an area dominated by a moist subhumid climate. This province is generally viewed as the broad ecotonal boundary of the forested Austroriparian (to the east) and the historically grassland-dominated Kansan and Balconian biotic provinces to the west. The intermingling of forests with grasslands is the most noteworthy characteristic of this biotic province.

No endemic species of vertebrates are known to occur within the Texan biotic province. Common mammals that occur within this province include Virginia opossum (*Didelphis virginiana*), fox squirrel (*Sciurus niger*), hispid cotton rat (*Sigmodon hispidus*), gopher (*Geomys breviceps*), eastern cottontail (*Sylvilagus floridanus*), swamp rabbit (*S. aquaticus*), and California jackrabbit (*Lepus californicus*). Other common animal species in the Texan biotic province include the green anole (*Anolis carolinensis*), collared lizard (*Crotaphytus collaris*), racer (*Coluber constrictor*), Baird's rat snake (*Elaphe obsoleta*), and western diamondback rattlesnake (*Crotalus atrox*).

III.C.2 Environmental Consequences of the No Build Alternative

If the No Build Alternative were implemented, no improvements would be made to IH 35. The existing roadway and associated clear zones would continue to be mowed and maintained at the current maintenance schedule. No additional effects to vegetation and wildlife habitat related to improvements to IH 35 would occur. Existing land use and activities, including periodic mowing and cultivation, would continue to periodically affect vegetation communities. Future development and associated vegetation disturbance in the project area would be anticipated to continue at the current rate.

III.C.3 Environmental Consequences of the Preferred Alternative

If the Preferred Alternative were implemented, approximately 134.3 acres of vegetation in the new right-of-way would be impacted. Vegetation in both the existing and new right-of-way would be cleared as required to accommodate the proposed roadway's main lanes, shoulders, overpasses, drainage ditches, and safety clear zones. Approximately 20.5 acres of developed land would be impacted.

Approximately 6.0 acres of cropland, 20.5 acres of developed land, 94.9 acres of grazing land, 0.16 acres of mixed hardwood woodland, and 3.0 acres of riparian woodland would be affected by the proposed project.

Effects to vegetation within the project area would involve the removal of trees and other vegetation. Native vegetation (i.e., upland and riparian woodlands and

grasslands) provides erosion inhibiting ground cover as well as habitat for many resident and migratory animal species. Woody vegetation within the study area includes mixed hardwood woodlands, juniper shrubland, pecan orchard, and riparian woodland. No native prairie or remnant grassland assemblages occur within the project area. Mature woody vegetation in the project area consists of medium to large (eight to 28 inches) live oak, post oak, pecan, green ash, black willow, sycamore, cottonwood, hackberry, gum bumelia, soapberry, chinaberry, box elder, Osage orange, American elm, and cedar elm, with the average dbh being 9-10 inches. Mature trees average approximately 25 feet in height and canopy ranges from less than 10 percent in riparian woodlands to 90 percent in riparian and mixed hardwood woodlands.

Riparian zones within the project area that would be affected include those associated with Bull Hide Creek, Castleman Creek, and Chambers Creek. These areas are relatively small and consist primarily of a mixture of trees, including black willow, hackberry, soapberry, and roughleaf dogwood with average diameters (dbh) ranging from four to 12 inches dbh. Canopy height within this area ranges from five to 25 feet with a canopy coverage of 10 to 90 percent. Vegetation along fencelines within the project area consists primarily of hackberry, gum bumelia, Ashe juniper, and mesquite. Some of the species described here would be removed during project construction.

Clearing of vegetation would be limited and/or phased to maintain a natural water quality buffer and minimize the amount of erodible earth exposed at any one time. Upon completion of earthwork operations, disturbed areas would be restored and seeded according to TxDOT's Vegetation Management Guidelines and in compliance with the intent of the FHWA *Executive Memorandum on Beneficial Landscapes and the FHWA Executive Order on Invasive Species*. This EA will be coordinated with the Texas Parks and Wildlife Department (TPWD), as part of the Memorandum of Understanding (MOU) between TxDOT and TPWD, in order for TPWD to comment on the project impact on natural resources.

Impacts to wildlife within the project area would most likely occur in conjunction with the removal of vegetation and disturbance in and around water features. Wooded areas provide cover, food, and habitat for many resident and migratory species. Highway related activities would cause disturbance of aquatic and terrestrial species found in riparian zones. The use of best management practices (BMPs), vegetation clearing techniques, and replanting would minimize impacts to wildlife habitat within the project area. Adjacent wildlife habitat would be protected from storm water runoff by implementing BMPs that would control erosion, post construction total suspended solids, and sedimentation control.

To minimize effects to wildlife, the clearing of vegetation would be minimized where practicable. Native vegetation would be re-established where practicable to replace important forage and cover for wildlife. Disturbance of nesting birds may be avoided by scheduling construction during the winter migration and non-breeding period. Riparian zones extend beyond the proposed right-of-way, so undisturbed areas near the project area could provide suitable habitat for any displaced species.

Effects to Minimize Impacts

According to the TxDOT/TPWD MOU, special habitat features require additional consideration in project planning. Special habitat features include:

- Bottomland hardwoods
- Caves
- Cliffs and bluffs
- Native prairies (particularly those with climax species of native grasses and forbs)
- Ponds (temporary and permanent, natural and man-made)
- Seeps or springs
- Snags (dead trees) or groups of snags
- Water bodies (creeks, streams, rivers, lakes, etc)
- Existing bridges with known or easily observed bird or bat colonies.

Water bodies within the project area (streams) are special habitat features; impacts to project area streams are discussed in **Section III.D.3.1 Impacts to Waters of the U.S.** Methods to reduce water quality impacts that could affect wildlife within project area streams are discussed in **Section III.D.3.3 Section 401 Compliance**

Efforts have been made to reduce the amount of additional right-of-way required in order to minimize impacts to adjacent land without compromising the safety of the traveling public. Where possible, culverts will be extended rather than replaced to minimize impacts to streams and riparian areas.

The impacted riparian sites described in this section extend on both sides of IH 35. Widening about the centerline or shifting the alignment in either direction would result in approximately the same amount of impact to this riparian corridor.

Compensatory mitigation for impacts to wildlife habitat along IH 35 was considered during project planning in accordance with Provision (4) (A) (ii) of the TxDOT-TPWD Memorandum Of Understanding (MOU) and the Memorandum of Agreement (MOA). The MOA designates the following habitat categories for which TxDOT would consider compensatory mitigation:

- Habitat for federal candidate species (impacted by the project) if mitigation would assist in the prevention of the listing of the species
- Rare vegetation series (S1, S2, or S3) that also locally provide habitat for a state-listed species
- All vegetation communities listed as S1 or S2
- Bottomland hardwoods, native prairies, and riparian sites
- Any other habitat feature considered to be locally important that the TxDOT district chooses to consider

Approximately 3.0 acres of riparian woodland, which meets the criteria of the MOA for consideration of compensatory mitigation, would be affected by this project. The riparian zones at Bull Hide Creek, Castleman Creek, and Chambers Creek contain an abundance of vegetation of similar composition and structure that which would be removed. Furthermore, the disturbance created at the edge of this riparian zone should produce seed-bearing forbs and other primary successional plants that will benefit wildlife in this area. Therefore, compensatory mitigation for impacted vegetation at these three sites was considered; however, no mitigation for loss of riparian habitat would be proposed for the project.

III.D. WATER RESOURCES

III.D.1 Existing Conditions

The entire project area is in the Brazos River Basin, which drains a total area of 45,573 square miles of Texas and New Mexico and stretches from the High Plains to the Gulf of Mexico. In order to monitor water quality, the Brazos River Basin has been divided into 55 segments not including reservoirs. In the project area, the surface water runs to the Brazos River, Segment 1242. The project corridor crosses North Cow Bayou, Bull Hide Creek, Castleman Creek, Chambers Creek, and their tributaries, all of which drain to Segment 1242 of the Brazos River.

The surface water in the project area drains to the Brazos River above Navasota River, Texas Commission on Environmental Quality (TCEQ) Segment #1242. This segment is not designated as threatened or impaired on either the 2004 or draft 2006 Clean Water Act Section 303(d) lists. The proposed project does not cross, and is not within five miles upstream of an impaired segment.

III.D.1.1 Wetlands/Waters of the U.S.

Wetlands are transitional areas between terrestrial and aquatic ecological systems. Many wetlands are protected under the Clean Water Act, and are regulated by the U.S. Army Corps of Engineers (USACE). The *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) defines wetlands based on three criteria: hydrophytic vegetation, hydric soils, and wetland hydrology. In general, all three criteria must be present for an area to qualify as a wetland. Some exceptions occur in disturbed areas or in newly formed wetlands, where one indicator (such as hydric soils) might be lacking. These areas are dealt with on an individual basis as outlined in the *Field Guide for Wetland Delineation*.

In addition to the jurisdictional wetlands defined above, the Clean Water Act regulates impacts to other waters of the United States. The term “waters of the United States” (WOTUS) has broad meaning and incorporates both deepwater aquatic habitats and special aquatic sites, including wetlands, as listed below:

- The territorial seas with respect to the discharge of fill material.
- Coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States, including their adjacent wetlands.
- Tributaries to navigable waters of the United States, including adjacent wetlands.
- Interstate waters and their tributaries, including adjacent wetlands.

All other waters of the United States not identified above, such as intermittent streams, prairie potholes, and other waters that are not a part of a tributary system to interstate waters or navigable waters of the United States, the degradation or destruction of which could affect interstate commerce. Note that isolated wetlands are currently outside of the USACE’s jurisdiction.

Waters of the U.S., including wetlands, may provide and/or promote the following functions: groundwater recharge, groundwater discharge, nutrient removal and/or transformation, production export, and the promotion of habitat and wildlife diversity and abundance. Waters of the U.S. are also valued for their recreational uses and uniqueness as ecological and physiographic zones.

A field wetland delineation was completed within the proposed right-of-way in September 2001, with supplemental data collection in December 2006 and June 2007. No wetlands and seven waters of the U.S. were identified within the proposed right-of-way. Waters of the U.S. (WOTUS) include all of the creek, branch, and other drainage crossings encountered during the field delineation. WOTUS data forms (See **Appendix F**) were filled out for each WOTUS crossing in order to describe the dominant vegetative species observed at each site, along with specific hydrologic and soil characteristics. The location of each WOTUS crossing may be found in **Appendix A (Plates 2-1 through 2-5)**; these WOTUS locations are numbered non-consecutively because several points were located outside of the proposed construction area.

Dominant tree species noted along these drainages include black willow (*Salix nigra*) and Texas sugarberry or hackberry (*Celtis laevigata*). The shrub/sapling layer is dominated by Texas sugarberry, black willow, soapberry (*Sapinus drummondii*) and roughleaf dogwood (*Cornus drummondii*). The dominant vine species are saw greenbrier (*Smilax bona-nox*), dewberry (*Rubus trivialis*), and poison ivy (*Toxicodendron radicans*). The herbaceous layer is dominated by giant ragweed (*Ambrosia trifida*), bermudagrass (*Cynodon dactylon*), Johnsongrass (*Sorghum halepense*), and skullcap (*Scutellaria drummondii*).

The proposed roadway improvements would cross seven waters of the U.S. Each of these WOTUS crossings is described below. Potential impacts to waters of the U.S. were calculated by multiplying the ordinary high water mark (OHWM) by the length of stream between the existing right-of-way and the proposed right-of-way, and converting to acres.

WOTUS 1 – Unnamed tributary to North Cow Bayou

The tributary to North Cow Bayou is not shown on U.S. Geologic Survey (USGS) topographic maps or National Wetland Inventory (NWI) maps. The Ordinary High Water Mark (OHWM) at the crossing is approximately 4 feet. This tributary is a water of the U.S. No adjacent wetlands were located in the area.

On the east side of IH 35, highway expansion would require the placement of additional fill (culverts) within the OHWM; therefore, impacts to waters of the U.S. would be approximately 0.02 acre at this location.

On the west side of IH 35, at the southwestern corner of the intersection of North FM 2837 and the IH 35 southbound frontage road, a detention pond is recommended to alleviate flooding problems along the Tributary to North Cow Bayou. The total length of the tributary at this location is 399.82 feet. When the pond is designed in more detail, potential impacts to jurisdictional waters in this area should be reassessed to determine which USACE permit would be required under Section 404. This issue is described in more detail in **Section III.D.3** below.

WOTUS 2 – Bull Hide Creek

Bull Hide Creek is shown on USGS topographic maps as a perennial stream and NWI maps classify the tributary as riverine, lower perennial, unconsolidated bottom, permanently flooded (R2UBH). The Ordinary High Water Mark (OHWM) at the crossing is approximately 10 feet. This tributary is a water of the U.S. No

adjacent wetlands were located in the area. Bull Hide Creek would be bridged at this crossing; therefore, no impacts to waters of the U.S. are expected to occur.

WOTUS 3/10 – Tributary to Bull Hide Creek

The tributary to Bull Hide Creek is shown on USGS topographic maps as an intermittent stream and NWI maps classify the tributary as riverine, intermittent, streambed, seasonally flooded (R4SBC). The Ordinary High Water Mark (OHWM) at the crossing is approximately two feet on the west side of IH 35 and approximately 15 feet on the east side of IH 35. At the time of the field visit, water was flowing in an easterly direction within the channel and was conveyed under the existing roadway by means of a 2-box concrete culvert. The water continues to flow for approximately 50 feet, then enters a single pipe culvert that extending underneath the parking area at Johnson Equipment. This tributary is a water of the U.S. No adjacent wetlands were located in the area. Highway expansion would require the placement of additional fill (culverts) within the OHWM; therefore, total impacts to waters of the U.S. would be approximately 0.05 acre at this crossing.

WOTUS 6 – Castleman Creek

Castleman Creek is shown on USGS topographic maps as an intermittent stream and NWI maps classify the tributary as riverine, intermittent, streambed, seasonally flooded (R4SBC). The Ordinary High Water Mark (OHWM) at the crossing is approximately four feet. This tributary is a water of the U.S. No adjacent wetlands were located in the area. Highway expansion would require the placement of additional fill (culverts) within the OHWM; therefore, impacts to waters of the U.S. would be approximately 0.02 acre at this crossing.

WOTUS 8 – Tributary to Chambers Creek

The tributary to Chambers Creek is not shown on USGS topographic maps or NWI maps. The Ordinary High Water Mark (OHWM) at the crossing is approximately two feet. This tributary is a water of the U.S. No adjacent wetlands were located in the area. Highway expansion would require the placement of additional fill (culverts) within the OHWM; therefore, impacts to waters of the U.S. would be approximately 0.004 acre at this crossing.

WOTUS 8a – Chambers Creek

Chambers Creek is shown on USGS topographic maps as an intermittent stream and NWI maps classify the tributary as riverine, intermittent, streambed, seasonally flooded (R4SBC). The Ordinary High Water Mark (OHWM) at the crossing is approximately three feet. This tributary is a water of the U.S. No adjacent wetlands were located in the area. Highway expansion would require the placement of additional fill (culverts) within the OHWM; therefore, impacts to waters of the U.S. would be approximately 0.008 acre at this crossing.

WOTUS 9 – Unnamed Tributary 1

Unnamed Tributary 1 is not depicted on USGS topographic maps or NWI maps. The Ordinary High Water Mark (OHWM) at the crossing is approximately 4 feet. This tributary is a water of the U.S. No adjacent wetlands are located in the area. Highway expansion would require the placement of additional fill

(culverts) within the OHWM; therefore, impacts to waters of the U.S. would be approximately 0.02 acre at this crossing.

III.D.2 Environmental Consequences of the No Build Alternative

If the No Build Alternative were implemented, no improvements would be made to IH 35. No impacts to waters of the U.S. or to water quality would occur, and no permits from the USACE would be required. Existing land use activities, including urban development, would continue as it does currently, incrementally affecting water quality.

III.D.3 Environmental Consequences of the Preferred Alternative

If the Preferred Alternative were implemented, six of the seven waters of the U.S. within the study corridor would be impacted. No wetlands are located in the proposed right-of-way. Permanent impacts include placement of fill for the proposed roadway, potentially including culverts, riprap, bank stabilization, and bridge support structures.

III.D.3.1 *Impacts to Waters of the U.S.*

Impacts to waters of the U.S. within the proposed right-of-way for each crossing are summarized in **Table 21**. Under nationwide permit regulations, any unavoidable discharges are expected to fall within the allowable limits of Nationwide Permit (NWP) #14, which provides for fill for roads crossing waters of the U. S., including wetlands and other aquatic sites. Criteria for compliance with NWP #14 include a requirement that fill placed in single and complete crossings of waters of the United States total no more than one-half acre and that the District Engineer be notified for crossings greater than 0.10 acre or if there is a discharge in a special aquatic site, including wetlands. Each of the crossings listed in **Table 21** qualifies as a single and complete project. Because no crossings would impact greater than 0.10 acre, it would not be necessary to submit a Pre-Construction Notification (PCN) to the U.S. Army Corps of Engineers. Only crossings in the project construction limits were evaluated.

A detention pond is proposed on the west side of IH 35, at the southwestern corner of the intersection of North FM 2837 and the IH 35 southbound frontage road, to alleviate flooding problems along the Tributary to North Cow Bayou. At this time, pond location is proposed but not finalized and specific design details are unavailable. As currently proposed the pond would impact as much as approximately 399.8 linear feet of a small tributary to North Cow Bayou. NWP #43 Stormwater Management Facilities provides for the discharge of fill material into waters of the U.S. for construction and maintenance of stormwater management facilities, including excavation of the basin and installation and maintenance of water control structures, outfall structures, and spillways. NWP #43 requires PCN to the USACE. Criteria for compliance with NWP #43 includes a requirement that the discharge must not cause the loss of greater than one-half acre, including the loss of no more than 300 linear feet of stream bed. Any impacts to waters of the U.S. that would be greater than 0.5 acre or 300 linear feet would require an Individual Permit. The total length of the tributary with the proposed pond “footprint” at this location is 399.8 feet. Although it is

unknown at this time how much of the stream would be impacted, it is recommended that the pond be designed such that impacts to the tributary are minimized. When the pond is designed in more detail, potential impacts to jurisdictional waters in this area should be reassessed to determine which USACE permit would be required under Section 404.

Table 21 Waters of the U.S. within Proposed Right-of-Way			
WOTUS #	Name	Mean OHWM (ft)	Impacts (acres)
1	Unnamed tributary to North Cow Bayou	4	0.02**
2	Bull Hide Creek	10	0*
3/10	Tributary to Bull Hide Creek	2 (west side of IH 35) 15 (east side of IH 35)	0.05
6	Castleman Creek	4	0.02
8	Tributary to Chambers Creek	2	0.004
8a	Chambers Creek	3	0.008
9	Unnamed Tributary 1	4	0.02
	Total		0.1

*Bull Hide Creek would be spanned by a bridge.

**Impacts listed here do not include potential impacts as a result of a proposed detention pond, for which specific design information is not yet available.

Proposed work in drainage channels could involve regrading the existing channels at culvert openings. Temporary fill material could be required during construction to allow machinery to access the channel. However, measures would be included to maintain preconstruction downstream flow rates. Permanent fill below the ordinary high water mark would be limited to culvert extensions. No jurisdictional waters would be channelized within the project limits. It is assumed that all crossings except Bull Hide Creek would be culverted. The bridge at Bull Hide Creek would span the channel, so no permanent impacts would occur. However, coordination with the USACE may be necessary prior to construction depending on construction methods and final bridge design details.

III.D.3.2 Stormwater Pollution Prevention Plan (SW3P)

The greatest potential for adverse impacts to surface water exists during the construction phase of the project due to the quantity of soil being disturbed. This project would disturb more than five acres of land; therefore, TxDOT and the contractor would be required to comply with the Texas Pollutant Discharge Elimination System General Permit for Construction Activities. This program seeks to control erosion and sedimentation from construction projects by means of the promulgation of a Stormwater Pollution Prevention Plan (SW3P) that must be written by the engineer or contractor and implemented just prior to beginning construction. The program consists of both management and structural Best Management Practices (BMPs) such as use of vegetated roadsides and flush shoulder aerobic ditches in order to keep pollutants from receiving waters. These controls are required to be put in place to slow the flow of water from the site and prevent the loosening and transport of soil particles from the site during construction. In order to comply with the regulations, an engineer or contractor is required to submit an SW3P to the TxDOT District Office so that a Notice of Intent (NOI) detailing construction plans and controls may be sent to the TCEQ prior to beginning construction. Following the completion of construction, a Notice of Termination (NOT) must be submitted by the District Office declaring that all BMPs were followed and that the project was in compliance with the TPDES requirements. The proposed project will comply with all applicable measures mandated by these regulations.

No long-term water quality impacts are expected as a result of the proposed project. The water quality of waters in the State shall be maintained in accordance with all applicable provisions of the Texas Surface Water Quality Standards, including the general narrative and numerical criteria. To minimize impacts to water quality during construction, the proposed project will utilize temporary erosion and sedimentation control practices outlined in TxDOT's guidance entitled *Standard Specifications for the Construction of Highways, Streets, and Bridges*. Where appropriate, these temporary erosion and sedimentation control structures will be in place prior to the initiation of construction and will be maintained throughout the duration of the construction.

III.D.3.3 **Section 401 Compliance**

If the Preferred Alternative were implemented, construction activities would require compliance with the State of Texas Water Quality Certification Program. Compliance with Section 401 of the Clean Water Act requires the use of BMPs to manage water quality on sites affecting jurisdictional waters. The SW3P would include as least one BMP from the 401 Water Quality Certification Conditions for Nationwide Permits (TCEQ 2007). These BMPs will address each of the following categories: 1) erosion control, 2) post construction total suspended solids (TSS) control and 3) sedimentation control. Category 1 would be addressed by planting temporary vegetation in disturbed areas. Category 2 would be addressed by applying silt fences combined with rock berms. Category 3 would be addressed by vegetation-lined drainage ditches. In addition to BMPs listed in this document, other approved methods may be substituted if necessary using one of the BMPs from the identical category.

BMPs would be used as necessary. The ditches would accept roadway runoff as sheet flow and filter it along the front slopes of the ditches as well as in the bottom of the ditch. These measures would minimize potential adverse impacts to water quality. With the implementation of these measures, no long-term water quality impacts are expected as a result of the proposed project.

III.E. RELOCATIONS AND RIGHT-OF-WAY (INCLUDING LAND USE)

III.E.1 Existing Conditions

The proposed project would be constructed in a mixed urban and rural area, beginning in the southern portion of the city of Lorena in McLennan County. After crossing Lorena, the project continues through predominantly agricultural/rangeland before reaching the city of Hewitt. The northern terminus is located at FM 2063 in Hewitt.

Land uses in the project area are primarily developed from South FM 2837 to North 2837 in the city of Lorena. North of Lorena, land uses are increasingly undeveloped/agricultural, with some areas of developed land. Land uses are described in detail below. See **Section III.E.3** for a description of land uses impacted by the proposed project within the limits of construction. See **Appendix A - Plates 1-1 through 1-5** for a depiction of land uses in the project area. See also **Section III.F Hazardous Materials**.

Between South FM 2837 and North FM 2837 the project crosses the city of Lorena, with most of the city's development located west of IH 35. The development on the west side of IH 35 consists of a mix of public facilities, places of worship, commercial land uses, and residences. Evans Field, which was formerly used as a baseball field by Lorena High School, is located at the southwest corner of South FM 2837 and IH 35. The former Lorena Middle School, due west of IH 35 and South FM 2837, is no longer used by Lorena ISD and was recently purchased by a private property owner (Moran, 2007). The First Baptist Church of Lorena is also located west of IH 35 and south of Center Street. The administration building for Lorena ISD and the Lorena Police Department are located on the west side of IH 35 between Center Street and North FM 2837. Commercial businesses on the west side of IH 35 between South FM 2837 and North FM 2837 include L&N Auto Sales, Chevron, Cook's Automotive, Brew's Self Storage, Brookshire Brothers, Conoco, and the Tobacco Barn.

The east side of IH 35 through the city of Lorena is less densely developed than the west side of the interstate. Although much of the land in this area is undeveloped, residential development is located at the southeast corner of IH 35 and South FM 2837. The McLennan County Tax Office is also located on the east side of IH 35. Furthermore, several businesses, including Phillips 66, Super Baytown Seafood Restaurant, Sanders Jewelry, Lorena Quick Lube, Ace Hardware, Lorena Diner and Deli, Connie's Carwash, and Extraco Bank, are located adjacent to IH 35 in this area.

From North FM 2837 to FM 3148 the project traverses a largely undeveloped area where agricultural uses predominate. Other than the McLennan County Storage Yard, the west side of IH 35 between North FM 2837 and FM 3148 is undeveloped. Although the east side of IH 35 within this area largely consists of agricultural/rangeland, some commercial development is also present. Businesses along the east side of IH 35 between FM 2837 and FM 3148 include Pappa Joe's, Williams Drywall Company, the Lorena Industrial Complex and Midtex Truck Repair, Interstate Homes, and Johnson Equipment. One residential development and no public facilities are located adjacent to the east side of IH 35 between North FM 2837 and FM 3148.

Between FM 3148 and the project's northern terminus at FM 2063, the west side of IH 35 is more densely developed than the east side of the interstate. A strip of businesses and a City of Hewitt water well line occur along the west side of IH 35 between FM 3148 and Baxley Road. Businesses between FM 3148 and Baxley Road include Me Maw's Kitchen, Conoco, Lone Star Electronics, R.O. Peoples Drywall and Installation, American Marble and Granite, American Engine, U.S. Tire, Larry's Color Pro, Texas Best Sprayers, UTEM Enterprise, UTEC, Fortenberry Insurance, the Vortex, and Sweet Air Filters. A subdivision is located behind the commercial strip bordering IH 35. The west side of IH 35 between Baxley Road and Industrial Place is undeveloped except for a city of Hewitt water well and two businesses, Walkabout RV Sales and Carla's Sign Shop. From Industrial Place to the project's northern terminus at FM 2063, commercial land uses predominate. Business in this area include Trey's Fuel Injection, Golden Mobile Homes, Marilyn Davis Insurance, Horn Mobile Homes, Leland's Storage Buildings, Wylie Sprayers, World Lift Truck, Alliance Distribution Inc., Ditch Witch Farm Equipment Company Inc, American Sales, and Joe's Starter Shop. Two residences are found along IH 35 between Industrial Place and the project terminus, and a subdivision is located directly behind the commercial developments. Other than a City of Hewitt water well,

the area south of Chambers Creek for a distance of approximately 1,300 feet is undeveloped.

The east side of IH 35 between FM 3148 and FM 2063 is largely undeveloped, with several businesses scattered among the predominately agricultural land. These businesses include Steve Palmer Homes, Homecenter of Waco, Bobcat of Waco, and Pilot Travel Center. In addition, a radio tower is located on the east side of IH 35, approximately 1,500 feet north of South Baxley.

III.E.2 Environmental Consequences of the No Build Alternative

If the No Build Alternative were selected, no new right-of-way would be acquired and no existing land use would be converted to transportation use.

III.E.3 Environmental Consequences of the Preferred Alternative

Right-of-way would be acquired to accommodate the ultimate configuration of three lanes in each direction. See **Figure 2, Existing and Proposed Typical Sections**. The total new right-of-way required for construction of the proposed project would be approximately 134.3 acres. According to the 2008-2011 STIP, the proposed construction cost would be \$66,100,000.

Approximately 134.3 acres of additional right-of-way would be required for the construction of the proposed project. Of these 134.3 acres, approximately 103.92 acres are comprised of undeveloped/agricultural land uses, 0.7 acres are residential land uses, 16.3 acres are commercial, and 4.0 acres are community facility land uses.

In general, the proposed improvements would necessitate the relocation of some utilities such as subterranean oil and gas lines and aerial utilities prior to construction. The relocation and/or adjustment of utilities in conflict would be coordinated with the appropriate responsible entities prior to construction and would be accomplished with minimal impact to the public. All utility relocation costs for utilities in the proposed right-of-way would be reimbursed.

Changes in Land Use/Value

Property values along the proposed roadway expansion could increase, especially where commercial development could occur. Studies of highway impacts on property values document that highways generally improve the values of adjoining commercial properties. The effects of highways on residential property values, however, are less clear. There are several negative externalities associated with highways (noise, pollution, dust, and decreased privacy) that may decrease adjacent residential property values. Noise is usually the externality most complained about, although people may perceive other problems (e.g., aesthetics and proximity) (Hall, et al., 1978). The most important positive externality of highways is increased mobility and transportation access to those living nearby. See **Section IV. Indirect and Cumulative Effects**.

Relocations

Table 22 summarizes the number and type of relocation or displacement that would be required for the proposed project to be constructed.

Table 22 Project Area Relocations/Displacements			
Location	Commercial Displacement	Residential Relocation	Other
South FM 2837 to North FM 2837	0	0	0
North FM 2837 to FM 3148	2	0	Hewitt water well McLennan County Precinct 1 storage area
FM 3148 to FM 2063	6	1 (dilapidated)	Hewitt water well
TOTAL	8 Commercial Displacements	1 Residential Relocation	3 Public Facilities

Three of the commercial structures to be displaced are currently vacant. The displacement of those structures, as well as the radio tower, would not impact customers or employees. Four of the commercial displacements could potentially have employee and customer impacts: Johnson Equipment Auction Yard, Steve Palmer Homes, Home Center of Waco, Bobcat of Waco. Based on business names, it appears that their customers may be regional rather than local due to their size. These businesses are all located on the east side of the roadway near the IH 35 intersections with Old Temple Road and Baxley. There is a large amount of undeveloped land near these businesses, and they all appear to have large enough properties so that some or all of these businesses would be able to relocate further away from the roadway while remaining on their existing property. This would reduce any impacts to customers and employees. TxDOT would ensure access to the nine businesses that would incur driveway impacts, thus minimizing impacts to the businesses, their customers, and their employees.

To ensure that decent, safe, and sanitary dwellings will be available to all affected businesses, the State's Relocation Assistance Program (RAP) will be available to all individuals and families displaced as a result of construction of the proposed project. The acquisition and relocation program would be conducted in accordance with the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (P.L. 91-646). Relocation resources would be made available to all residential relocations and business displacements without discrimination, consistent with the requirements of the Civil Rights Act of 1964 and the Housing and Urban Development Act of 1974.

According to www.realtor.com, s of May 8, 2007, there were 44 housing units available in Lorena and 108 housing units available in Hewitt, of which there were 24 in Lorena and 77 in Hewitt for under \$190,000 (see **Table 23**). Although the one residential relocation in the project area consists of one residence that appears to be unoccupied and dilapidated, these data indicate that there would be sufficient replacement housing within the general project study area to accommodate the housing needs of any relocated residents.

Table 23 Housing Availability by Price Range, Lorena and Hewitt, Texas		
Price Range	Units in Lorena	Units in Hewitt
\$40,000 - \$89,999	4	3
\$90,000 - \$139,999	7	40
\$140,000 - \$189,999	13	34
\$190,000 - \$239,999	9	21
\$240,000 - \$289,999	4	5
\$290,000 - \$339,999	3	0
\$340,000 - \$389,999	1	0
\$390,000 - \$439,999	0	0
\$440,000 - \$489,999	0	0
\$490,000 - \$539,999	0	0
\$540,000 - \$589,999	1	0
\$590,000 and over	2	0
Total	44	108

Source: www.realtor.com accessed on May 8, 2007.

It has not yet been determined if the businesses' clientele and employees are drawn from a regional or local pool. TxDOT will work with the business owners to determine what the impact of a relocation would be on the business, and how that impact would differ if the relocation were outside of the immediate area. If relocating outside of the community could result in negative impacts to the business, TxDOT will make every effort to assist the businesses in relocating in the vicinity. TxDOT ROW officials will work with the businesses to assist in locating available properties within the community.

According to LoopNet (www.loopnet.com, accessed on August 23, 2007), there were several commercial and industrial properties for sale in Robinson, Hewitt, and Lorena. **Table 23a** summarizes the size, price, and other information about these properties.

Table 23a Commercial Property for Sale in Hewitt, Lorena, and Robinson, Texas			
Acreage or Square Footage	Price	Type	Description
2.84 acres	\$555,867	Commercial	Front corner of Rancho Lorena subdivision.
3,500 square feet	\$87,500	Office/warehouse	Office/shop/warehouse with fenced yard in Robinson.
34.09 acres	\$1,100,000	Retail (land)	Site at Hwy 77/Hwy 6 in Robinson.
31 acres	\$1,350,360	Commercial/Other (land)	A lot of frontage on Sun Valley Road in Hewitt.
15,000 square feet	\$495,000	Truck Terminal/Hub/Transit	In Hewitt.
1.84 acres	\$440,000	Commercial/Other (land)	80,000 square feet fronting Hwy 77 in Robinson.
15 acres	\$385,000	Commercial/Other (land)	Situated between Shell fuel station and Quick Lube in Robinson.
3.5 acres	\$195,000	Commercial/Other (land)	On Hwy 77 in middle of Robinson.
3.25 acres	\$707,850	Commercial/Other (land)	In Hewitt, at FM 1695 and Ritchie Road
10.6 acres	\$3,300,000	Commercial/Other (land)	Direct frontage on IH 35 six miles south of Waco in Robinson.
2.37 acres	\$541,995	Retail-Pad (land)	IH 35 and Spring Valley in Hewitt.
5 acres	\$413,820	Industrial (land)	Flexible light industrial parcels in new mixed-used development; city water and sewer; immediate access to IH 35.
2.25 acres	\$80,000	Industrial (land)	On Ava Drive in Hewitt. Surrounding uses include light industrial and office-warehouse.

III.F. HAZARDOUS MATERIALS

III.F.1 Existing Conditions

A review of environmental regulatory databases was performed in order to locate and document hazardous waste sites within the IH 35 project area. A regulatory databases review was prepared by Environmental Data Resources, Inc. (EDR) in May 2000. A review of the TCEQ petroleum storage tank database was conducted in June 2002. In February 2007, a search of the TCEQ's petroleum storage tank, superfund, and regulated entities databases was conducted. The purpose of the database reviews is to determine if sites located within the proposed project area are listed as having a past or present record of actual or potential environmental impact or are under investigation for non-compliance with a hazardous material regulation. A total of 12 sites were identified in the database searches.

Field investigations were conducted in September 2001 and December 2006 to verify the locations of the sites listed in the database search. The locations of two of the listed sites, Pump and Save and Lorena Quick Stop, could not be confirmed in the field; all other listed sites were field-verified. An additional 11 potential hazardous materials sites were identified during the field investigations.

More detailed information on potential hazardous materials sites identified through the database searches and field investigations, appears in **Table 24** below, and locations of these sites are depicted on **Appendix A – Plates 1-1 through 1-5**.

Table 24 Potential Hazardous Materials Sites in the Project Area					
Map ID	Site Name	Site Address	Type	Date of Record	Status of Site
HM-4	Wholesale Spas & Carpet (Midtex Equipment)	Northeast corner of IH 35 and FM 3148	2 USTs	6/6/90	All tanks removed from ground.
HM-5	Williams Travel Center	8055 S IH 35 Robinson 76706	UST	NA	Site appears in EDR Orphan Summary Report.
HM-6	CEFCO Food Mart #5 (Texaco)	732 Sun Valley Rd Hewitt	3 USTs	Tanks registered 7/25/90	All tanks in use
HM-7	Diamond Shamrock #1328	720 Spring Valley Hewitt 76705	4 USTs TX Spills	Tanks registered 5/8/86 Date of spill 2/28/91	All tanks in use <100 Gallons of diesel spilled.
HM-16	Lorena Service Station (Red's Shell Station)	S Exit of IH 35 Lorena 76655	7 USTs	Tanks registered 5/8/86	5 tanks in use 2 tanks abandoned in place.
HM-17	Precinct 1 Headquarters (McLennan County Storage Yard)	I-35 at Bullhide Creek Lorena 76655	3 USTs	Tanks registered 5/8/86	All tanks removed from ground.
HM-18	Brookshire Brothers 663 (Conoco)	406 N Frontage Lorena	2 USTs	Tanks registered 2.22.99	All tanks in use
HM-19	Lorena ISD	308 N Frontage Road Lorena 76655	FINDS	12/01/86 LUST on 11/4/92	Ground water impacted – no apparent threats to receptors
HM-20	Lorena Fastime (Chevron)	216 S Frontage Road Lorena 76655	7 USTs	Tanks registered 5/8/86	4 tanks in use. 3 tanks permanently filled in place.

Table 24 Potential Hazardous Materials Sites in the Project Area					
Map ID	Site Name	Site Address	Type	Date of Record	Status of Site
NA	Pump & Save	408 Frontage Road Lorena 76655	UST	–	Site appears in EDR Orphan Summary Report.
NA	Lorena Quick Stop	1042 Frontage Road Lorena 76655	LUST	–	Site appears in EDR Orphan Summary Report.
HM-2	Mid Tex Truck Repair	IH 35 and Mid Tex Road Lorena 76655	IHW	–	Site listed on TCEQ regulated entities registry.
HM-1	Philips 66	East of IH 35 north of S FM 2837	Gas Station	–	Observed in field
HM-3	Johnson Equipment (auction yard)	Southeast corner of IH 35 and FM 3148	Possible old battery storage, and other refinishing material storage	–	Observed in field
HM-8	Joe's Starter Shop	West of IH 35 north of Industrial Drive	Possible old battery storage, and other refinishing material storage	–	Observed in field
HM-9	Ditch Witch Farm Equipment Co., Inc.	West of IH 35 north of Industrial Drive	Possible ASTs	–	Observed in field
HM-10	Farm Equipment Distributing, Inc.	West of IH 35 north of Industrial Drive	Possible ASTs	–	Observed in field
HM-11	World Lift Truck	West of IH 35 north of Industrial Drive	Possible ASTs	–	Observed in field
HM-12	Country Garage	West of IH 35 north of FM 3148	Possible old battery storage, and other refinishing material storage	–	Observed in field
HM-13	UTEC	West of IH 35 north of FM 3148	Possible storage of solvents	–	Observed in field
HM-14	Larry's Color Pro	West of IH 35 north of FM 3148	Paint and body shop; possible paint disposal, solvents	–	Observed in field
HM-15	Precision Machine	West of IH 35 north of FM 3148	Possible storage of solvents	–	Observed in field
HM-21	Quick Lube	East of IH 35 north of South FM 2837	Automotive oil and possibly other solvents	–	Observed in field

NA = not mapped.

Sources:

EDR, Inc. Corridor Study Report, 5/30/2000.

TCEQ Petroleum Storage Tank Database Search 6/14/02.

TCEQ. PST Registration Database. http://www.tceq.state.tx.us/permitting/registration/pst/pst_query.html, accessed February 28, 2007.

TCEQ. Superfund Registry. Index to Superfund Sites by County. <http://www.tceq.state.tx.us/remediation/superfund/sites/county/index.html>, accessed February 28, 2007.

TCEQ. Industrial and Hazardous Waste Corrective Hazardous Program (RCRA). Central Registry: Regulated Entity Search. <http://www.tceq.state.tx.us/crpub/>, accessed February 28, 2007.

III.F.2 Environmental Consequences of the No Build Alternative

No impacts to potential hazardous materials sites would occur from right-of-way acquisition and construction if the No Build Alternative were selected.

III.F.3 Environmental Consequences of the Preferred Alternative

Several businesses along IH 35 handle regulated materials such as petroleum products, waste oils, lubricating oils, hydraulic fluids, dry cleaning solvents, or acidic compounds. Within the limits of the current project (South FM 2837 to FM 2863), land uses are a mix of urban and rural. There were a total of 12 sites identified in the database searches with recorded hazardous materials (see **Table 22**), of which two could not be confirmed in the field. Twelve additional potential hazardous materials sites were identified during field investigations.

The Registered Underground Storage Tanks (UST) database lists regulated underground storage tanks. There are nine locations with USTs within the project area, one of which could not be verified within the project area.

The Leaking Underground Storage Tank (LUST) database contains an inventory of reported leaking underground storage tank incidents. This information is maintained by the TCEQ. There is one site in the LUST database whose location could not be verified within the project area. The address for Lorena Quick Stop provided by the database search could not be mapped and the business could not be found in local phone directories.

The Texas Spills (TX Spills) database lists spills of hazardous materials requiring an emergency response. This information is maintained by the TCEQ. There is one location in the project area that appears in the TX Spills database (HM 7).

The Facility Index System (FINDS) is a composite database that contains both facility information and 'pointers' to other sources that contain more detail. This information is maintained by the Environmental Protection Agency. There is one location in the project area that appears in the FINDS database (HM 19).

The Individual Hazardous Waste (IHW) database is a listing of industrial hazardous waste generators maintained by the TCEQ. There is one location in the project area that appears in the IHW database (HM 2).

Two of the sites listed in the databases or observed in the field would be affected by the proposed construction. The McLennan County Precinct 1 storage area (HM-17) and one vacant commercial property (HM-4) would be relocated by the proposed project. The database search and field investigations conducted for this report do not constitute full Phase I Environmental Site Assessment.

Should soil and/or groundwater contamination be encountered within the IH 35 right-of-way during construction operations, said materials would be assessed, handled, removed, and disposed of in compliance with applicable local, state, and federal regulations. Remediation of such property would be the responsibility of TxDOT. The contractor would take appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction staging area. Hazardous items that require special handling would

be removed only by certified and licensed abatement contractors having documentation of prior acceptable work.

As required by the Texas Asbestos Health Protection Rules (25 TAC 295.61), a survey for asbestos containing materials (ACM) and a ten-working day, predemolition notification would be required prior to the renovation and demolition of any public structures, including span bridges. If asbestos is confirmed, then asbestos-related activities and the renovation would need to be performed in accordance with the Texas Asbestos Health Protection Act (TAHPA) and the National Emissions Standards for Hazardous Air Pollutants (NESHAP).

III.G. CULTURAL RESOURCES

1. *Regulatory Framework*

The National Environmental Policy Act (NEPA) requires consideration of important historic, cultural, and natural aspects of our national heritage. Important aspects of our national heritage that may be present in the project corridor will be considered under Section 106 of the National Historic Preservation Act of 1966, as amended. This act requires federal agencies to “take into account” the “effect” that an undertaking will have on “historic properties”. Historic properties are those included in or eligible for listing in the NRHP and may include structures, buildings/districts, objects, cemeteries, and archeological sites. In accordance with the Advisory Council on Historic Preservation (ACHP) regulations pertaining to the protection of historic properties (36 CFR 800.4), federal agencies are required to locate, evaluate, and assess the effects that the undertaking will have on such properties. These steps shall be completed under terms of the First Amended Programmatic Agreement regarding the implementation of transportation undertakings (PA-TU).

This project also falls under the purview of the Texas Antiquities Code (TAC), because it may involve lands owned or controlled by the State of Texas or any city, county, or local municipality thereof. As the project would involve state purchase of right-of-way, or lands belonging to local municipalities and counties, under jurisdiction of the Texas Antiquities Code, historic properties will also be considered under provisions of the Memorandum of Understanding (MOU) between the SHPO and TxDOT. The TAC allows for all such properties to be considered as State Archeological Landmarks (SALs) and requires that each be examined in terms of possible “significance”. Significance standards for the code are clearly outlined under Chapter 26 of the Texas Historical Commission (THC)’s Rules of Practice and Procedure for the TAC and closely follow those of the U.S. Secretary of Interior’s Standards and guidelines.

2. *Archeological Resources*

A search of the site records maintained by the Texas Archeological Research Laboratory and the Texas Historical Commission (THC) identified no previously recorded archeological sites, State Archeological Landmarks (SALs) or archeological sites listed on the NRHP within the proposed project area. Two surveys have been conducted that are close to or overlap the project area. In 1998 the Texas Water Development Board sponsored a survey for a wastewater that runs along the east side of IH 35 from just north of Lorena to approximately one mile south of the FM2063. No sites were recorded during that survey. In

2002 TxDOT sponsored an archeological survey of selected high probability areas around IH 35 that would be impacted by the current project. The survey investigated around Bull Hide Creek and Castleman Creek. Formal coordination with the THC occurred on December 18, 2002 and again on May 4, 2004 according to the stipulations of the Programmatic Agreement among the Texas Historical Commission, the Federal Highway Administration, the Texas Department of Transportation, and the Advisory Council on Historic Preservation.

Effects on Archeological Resources

A TxDOT archeologist evaluated the potential for the proposed undertaking to affect archeological historic properties or State Archeological Landmarks in the Area of Potential Effect. TxDOT completed its review on May 4, 2004. Pursuant to Stipulation VI of the PA-TU, TxDOT finds that the APE does not contain archeological historic properties (36 CFR 800.16(1)), and thus the proposed undertaking would not affect archeological historic properties. The project does not merit further field investigations. Project planning can also proceed, in compliance with 13 TAC 26.20(2) and 43 TAC 2.24(f)(1)(C) of the Memorandum of Understanding (MOU). Section 106 consultation with federally recognized Native American tribes with a demonstrated historic interest in the area was initiated on July 26, 2001. No objections or expressions of concern were received within the comment period. Section 106 review and consultation has proceeded in accordance with the First Amended Programmatic Agreement among the Federal Highway Administration, the Texas Department of Transportation, the Texas State Historic Preservation Officer, and the Advisor Council on Historic Preservation Regarding the Implementation of Transportation Undertakings (PA-TU), as well as the MOU between the Texas Historical Commission and TxDOT. In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area will cease and TxDOT archeological staff will be contacted to initiate post-review discovery procedures under the provisions of the PA-TU and MOU.

3. Historic Non-Archeological Resources

A review of the National Register of Historic Places (NRHP), the list of State Archeological Landmarks (SAL), and the list of Recorded Texas Historic Landmarks (RTHL) indicated that no historically significant properties have been previously documented within the area of potential effects (APE). Furthermore, there are no Official State Historical Markers (OSHM) in the APE. It has been determined through consultation with the State Historic Preservation Officer (SHPO) that the APE is limited to 150 feet beyond the edge of the proposed right-of-way. Per TxDOT Section 106 Notification of a Finding of No Effect letter dated July 13, 2004, a site visit of the project area conducted by TxDOT identified that there are eighteen historic-age resources (built prior to 1963) located within the project area of potential effects. TxDOT historians determined that none of the historic-age resources meet the criteria for listing in the NRHP. THC signed the concurrence letter on July 21, 2004.

Pursuant to Stipulation VI "Undertakings with Potential to Cause Effects" of the First Amended Statewide Programmatic Agreement for Cultural Resources (PA), between the Federal Highway Administration (FHWA), the Texas State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation, and the Texas Department of Transportation (TxDOT) and the Memorandum of Understanding (MOU), TxDOT-ENV historians determined that none of the

historic-age resources are eligible for listing in the National Register of Historic Places (NRHP). Since the properties are not NRHP eligible, the project would have no effects to historic properties and further individual project coordination with SHPO is not required. The coordination letters with SHPO are included in **Appendix D.**

IV. INDIRECT AND CUMULATIVE EFFECTS

IV.A. REGULATORY BACKGROUND

Federal law defines indirect effects as effects “which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems” (NEPA, Section 1508.8, 1978). Cumulative effects are defined as effects “on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (NEPA, Section 1508.7, 1978).

In accordance with TxDOT’s guidelines (2006), the analysis of cumulative effects addresses the following: identification of resources; definition of the study area for each resource; description of the current health and historical context of each resource; identification of direct and indirect impacts that may contribute to cumulative impacts; identification of other reasonably foreseeable future actions that may contribute to cumulative impacts on the identified resources; assessment of potential cumulative impacts to each resource; and discussion of mitigation issues for adverse impacts. **Figure 6** shows the study area for the cumulative and indirect impact analysis.

This section addresses indirect effects, the determination of resources assessed for cumulative effects, then follows the eight step process described above for cumulative effects.

IV.B. INDIRECT EFFECTS

According to CEQ (CEQ Guidelines 1508.8), indirect impacts are defined as: impacts that are caused by an action and occur later in time, or at another location, yet are reasonably foreseeable in the future. Induced growth is an example of an indirect impact. The FHWA (1992) has equated indirect effects with secondary effects and adopts the CEQ definition of cumulative effects in 40 CFR 1508.7, but notes that, “these impacts are less defined than secondary effects. The cumulative effects of an action may be undetectable when viewed in the individual context of direct and even secondary impacts, but nonetheless can add to other disturbances and eventually lead to a measurable environmental change.”

The study area for indirect effects is two miles on either side of existing IH 35. The National Cooperative Highway Research Program (NCHRP) Report 466, *Desk Reference for estimating Indirect Effects of Proposed Transportation Projects* (National Research Council, 2002) states that “development effects are most often found up to one mile around a freeway interchange, up to two to five miles along major feeder roadways to the interchange, and up to one-half mile around a transit station”. The NCHRP Report 466 goes on to say that there are certain general circumstances which may influence the likelihood of induced development shifts (National Research Council, 2002). Thus, the two-to five-mile boundary serves as a guideline, and individual projects must be analyzed

case-by-case. Based on a review of the project corridor, it was determined that a two-mile buffer around the IH 35 roadway was appropriate for assessment of indirect effects to resources. The corridor terminates in Lorena to the south and Hewitt in the north.

In order to assess the potential for both indirect and cumulative effects within this two-mile corridor, interviews were conducted with planning officials. John Moran (2007), City Manager for the City of Lorena, Dick Fletcher (2007), City Manager for the City of Robinson, and Barry Sullivan (2007), Assistant City Manager for the City of Hewitt were interviewed in an effort to identify planned developments and to what degree change was anticipated in connection with improvements to IH 35. More specific results of these interviews are included in **Section IV.G. Other Past, Present, and Reasonable Foreseeable Future Actions**. The planning officials indicated in discussions with Hicks & Company staff that they felt roadway improvements to IH 35 would not have much additional induced land use effects in the immediate areas because IH 35 has been a predominant feature in the landscape since its construction in the 1960s. In addition, other factors such as limited wastewater capacity affect development rates perhaps to a greater degree than the proposed roadway improvements. The planning officials indicated that possibly the rate of development might increase slightly once roadway improvements are made to IH 35, but the nature or amount of that development would not be changed substantially. Therefore, the potential indirect impacts to resources in the project area are discussed qualitatively, below. Cumulative effects are discussed for certain resource categories in **Section IV.C**.

The resources discussed in this section are resources that were selected for further analysis in this study. As discussed in **Chapter I**, there were several environmental resources that were eliminated from further study because impacts to them did not help distinguish one alternative from another, or because the resource was not found in the project area. Each resource considered in **Chapter III** will be discussed briefly below with respect to potential indirect effects.

Air Quality

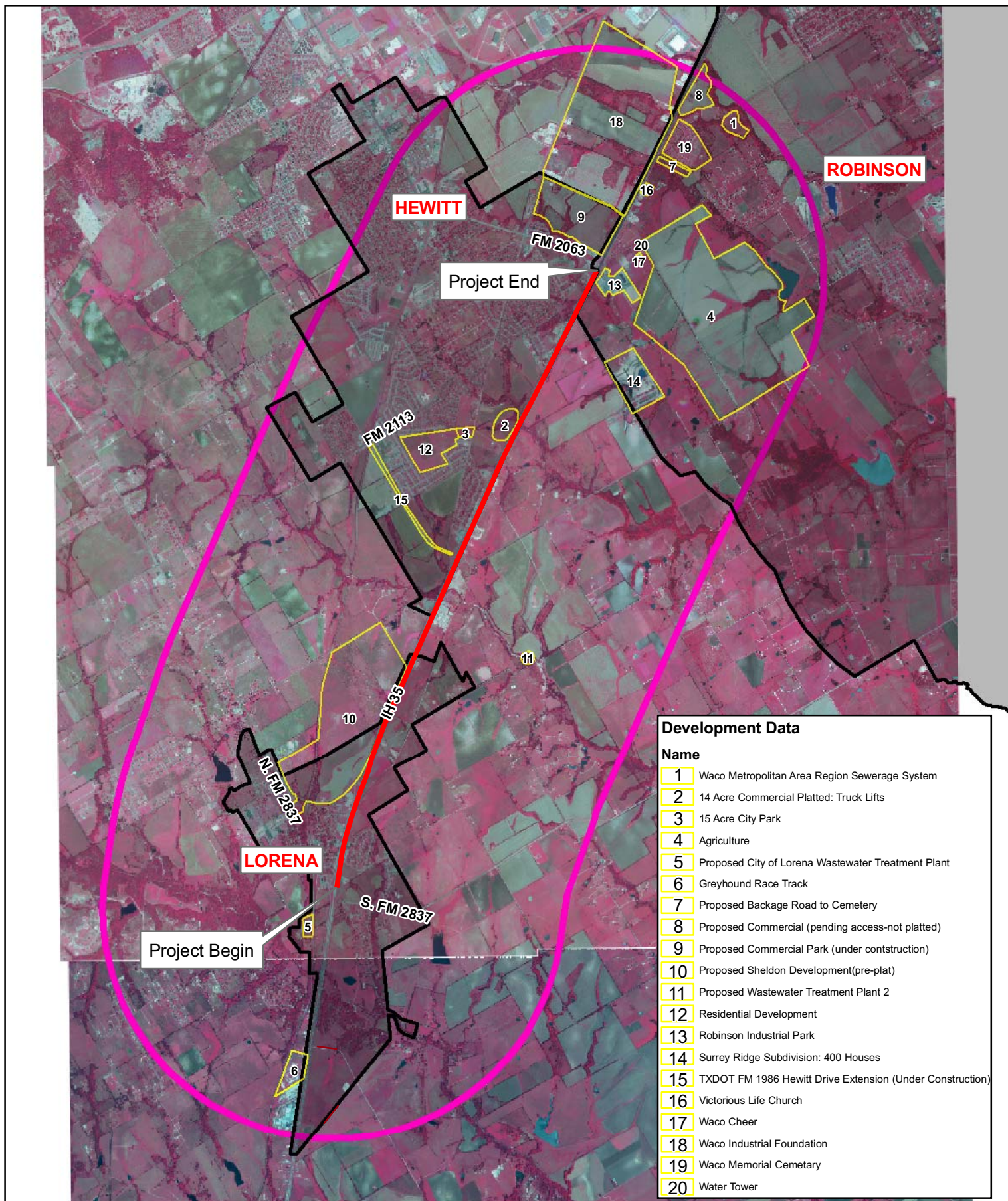
Indirect effects to air quality would include fugitive dust and emissions related to any nearby construction activity.

Wildlife and Vegetation

Induced land use development would result in the conversion of nearby vegetation types to developed land uses. Some wildlife habitat may be lost or may decline in quality if land uses convert to developed uses. At the same time, disturbance along riparian zones may produce seed-bearing forbs and other primary successional plants that would benefit wildlife in the area.

Water Resources including Waters of the U.S. and Wetlands

Increased sedimentation of streams and wetlands may occur where induced development occurs. Changes in hydrologic and flow conditions associated with runoff and drainage flow may occur.

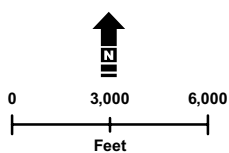


**IH 35
from FM 2837 to FM 2063
Indirect and Cumulative Effects Study Area**

Figure 6

Legend

- Project Area
- 2 Mile Radius
- City Limits



Relocations/Displacements and Right-of-Way (including Land Use)

One residential relocation and multiple business displacements would be caused directly by the proposed project. (As a policy, TxDOT provides relocation assistance to residences affected by a project, but typically compensates businesses without necessarily providing relocation assistance). An indirect effect of displacements and relocations would be loss of customer base for local businesses, and loss of the property tax base from displaced residences and businesses. The impacts to the businesses' employees and customers is expected to be minimal as it appears likely that the four businesses could either relocate further from the roadway on their existing property or nearby on undeveloped land. With improved transportation facilities, land use development may increase, particularly at intersections which may have a positive impact on the local economy.

Hazardous Materials

An indirect effect of induced land use development may be that commercial and/or subdivision development results in Phase I Environmental Site Assessment investigations, which would in turn require that discovered sites be brought in to compliance with relevant TCEQ and EPA regulations.

Archeology

Induced land use development may result in impacts to unrecorded cultural resource sites from development projects on private property that do not require cultural resource investigation because public funds or permits are not required. A certain percentage of unrecorded sites could be expected to be adversely affected in an indirect effects area around the proposed project.

Historic Resources

According to the Programmatic Agreement between THC and TxDOT, indirect effects of proposed projects on historic resources beyond the footprint of the proposed right-of-way are addressed. However, impacts to historic resource sites from development projects on private property may not be investigated since public funds do not require compliance.

These Indirect Effects are summarized in **Table 23** below as they are part of the determination of whether or not to assess particular resources for the cumulative effects analysis.

IV.C DETERMINATION OF RESOURCES INCLUDED IN THE CUMULATIVE EFFECTS ANALYSIS

According to TxDOT guidance (December 2006), if a project does not cause direct or indirect impacts on a resource, it will not contribute to a cumulative impact on that resource. This analysis focuses on resources that are affected by the Proposed Action and considered to be at risk of declining. Direct and indirect effects are described by resource category below in **Table 25**.

Table 25 Determination of Resources Included in the Cumulative Effects Analysis				
Resource	Summary of Direct Effects	Indirect Effects	Topic to be Included in Cumulative Effects Analysis	Reason Eliminated from Cumulative Effects Analysis
Wildlife and Vegetation	3.0 acres riparian vegetation affected	Conversion of vegetation to developed uses; loss or decline of habitat	Y	N/A
Water Resources including Waters of the U.S. and Wetlands	Seven waters of the U.S. crossed by project	Increased sedimentation of streams, changes in hydrologic flow, increased runoff	Y	N/A
Relocations/Displacements and Right-of-Way (including Land Use)	1 residence relocated, 9 businesses displaced, 3 public facilities displaced (2 water wells, McLennan County Precinct 1 storage area)	Loss of customer base for local businesses; loss of property taxes; increased access for some local businesses	Y	N/A
Hazardous Materials	2 UST sites displaced (McLennan County Precinct 1 storage area and Vacant Commercial property)	Induced land use development may result in site identification and remediation	N	Impacts to hazardous materials sites would result in remediation (improved situation)
Archeology	No proposed development would impact known sites, however unrecorded archeological sites maybe present.	A certain percentage of sites could be expected to be adversely affected in an indirect effects area around the proposed project.	Y	N/A
Historic Resources	No NRHP properties would be affected.	No NRHP properties are in the area that would be indirectly affected.	N	No direct or indirect effects to NRHP properties.
Air Quality	No NAAQs conformity applies	Fugitive dust from construction	N	Area in Attainment

IV.D. DEFINITION OF STUDY AREA FOR EACH RESOURCE CONSIDERED IN CUMULATIVE EFFECTS ANALYSIS

The Resource Study Area (RSA) for each resource was chosen based on the determination of the potential direct effects and indirect effects stemming chiefly from changes in land use occurring around IH 35 as well as other known projects that may contribute to cumulative effects. The RSAs were reviewed from both temporal and geographic perspectives. The timeframe in which effects to resources were considered for this analysis is the present day (since the highway's past construction and effects on adjacent land uses are best captured by reviewing the current situation), to 2030 which is the date of the Waco Metropolitan Transportation Plan. **Table 26** lists the geographic area reviewed for the RSA for each resource.

Table 26 Resource Study Area (RSA) for Each Resource Considered in the Cumulative Effects Analysis	
Resource	Resource Study Area
Wildlife and Vegetation	Blackland Prairies; Cross Timbers and Prairies; Floodplains associated with Bull Hide Creek, Castleman Creek, Chambers Creek, and their tributaries
Water Resources including Waters of the U.S. and Wetlands	Brazos River Basin, Segment #1242
Relocations/Displacements and Right-of-Way (including Land Use)	Local neighborhoods; City of Lorena; City of Hewitt
Archeology	Approximately 2 miles on either side of the existing roadway

IV.E. CURRENT HEALTH AND HISTORICAL CONTEXT OF RESOURCES

Wildlife and Vegetation

The project area occurs on the border between the Blackland Prairies and Cross Timbers and Prairies regions of Texas (Gould et al., 1960). The main vegetation type of this region is Crops. See **Figure 5**. The MOU between TxDOT and Texas Parks and Wildlife Department states that riparian vegetation constitutes unusual vegetation. The health of the vegetation/wildlife habitat resource in the project area is considered stable, recognizing the slight decline of habitat as development occurs in the two-mile study area.

Water Resources including Waters of the U.S. and Wetlands

The entire project area is in the Brazos River Basin, which drains a total area of 45,573 square miles of Texas and New Mexico and stretches from the High Plains to the Gulf of Mexico. In the majority of the project area, the surface water runs to Segment #1242, the Brazos River above Navasota River. According to TCEQ, there are no known water quality problems in this segment. There are some wetland areas identified by the National Wetlands Inventory but not field verified within the two-mile study area for indirect and cumulative effects. The health of this resource in the RSA is considered stable (slight decline) assuming that the proposed project would have to comply with existing Clean Water Act regulations.

Relocations/Displacements and Right-of-Way (including Land Use)

The project area is urban to the north where it ends south of the city of Waco and somewhat urban to the south where it ends at Lorena. Hewitt and, to some extent Robinson, are increasingly becoming bedroom communities for Waco. Between Hewitt and Lorena, there are scattered developed land uses but it does not appear that much new development is planned or anticipated. The area between the two cities can be expected to remain relatively rural with some development in the future. Growth within Hewitt, Robinson, or Lorena would be according to planned development by the city and in accordance with the Waco Mobility 2030 Plan. Most growth would occur south of the project area and would also be addressed in the environmental document being prepared for that segment of IH 35 widening.

As shown in **Table 27**, land use in the county changed primarily in the areas of minor land cover/uses, which increased by 41.7 percent between 1992 and 1997, and urban-small and large built-up, which increased by 12.1 percent between 1992 and 1997. Additional changes in these two land use types may have occurred in the period between 1997 and 2007. The proposed project would contribute to increased acreages dedicated to transportation uses. The RSA appears to be stable.

Table 27 Land Use Cover in McClennan County - 1992- 1997 (estimates in 1,000s of acres)			
	1992	1997	Percent change 92-97
Cropland-cultivated est	208.6	200.8	-3.7%
Cropland-noncultivated est	7.9	7.9	0.0%
Pastureland est	203.5	197.3	-3.0%
Rangeland est	150.1	150.9	0.5%
Forest land est	0	0	0.0%
Minor land cover/uses est	16.8	23.8	41.7%
Urban-small and large built-up est	50.4	56.5	12.1%
Rural transportation-roads and railroads est	12.3	12.3	0.0%
Water-small-streams < 660 feet wide and water bodies < 40 acres est	5.1	5.2	2.0%
Water-census-streams >= 660 feet wide and water bodies >= 40 acres est	9.9	9.9	0.0%
Federal land-cover/use not recorded est	10.9	10.9	0.0%
Conservation Reserve Program est	3.1	3.1	0.0%
Total est	678.6	678.6	0.0%
Total err	11.635	11.635	0.0%

Source: Natural Resources Inventory, Natural Resources Conservation Service

Archeology

The resource study area for this project encompasses roughly two miles on either side of the proposed IH 35 expansion segment. No sites lie within the direct APE of the road expansion project. There are three recorded sites within approximately a two mile radius of the expansion area of the undertaking. Site 41ML96 is a multicomponent historic debris scatter and prehistoric rock hearth associated with bone and shell located on the north bank of Cow Bayou. Sites 41ML211 and 41ML210 are both historic tenant farm sites located along Castleman Creek in the City of Hewitt. Unrecorded sites would likely conform to the same distribution pattern, with the majority of prehistoric sites clustering along the waterways or overlooking them. The towns of Lorena and Hewitt have a higher probability for historic archeological sites. Theoretically prehistoric sites, if not already impacted by development, could be found along Bull Hide Creek, Castleman Creek, Chamber's Creek or any other drainages.

There is currently no proposed development that would impact recorded archeological sites. However, unrecorded archeological sites may be present in these areas of new development. The likelihood for archeological sites is greatest in those developments that are located near major waterways, such as the planned Robinson Industrial Park which would be located near the project's northern terminus on the east side of IH 35. Publicly funded development or any development requiring federal or state planning permits would be required to identify archeological resources within the APE of the undertaking and offer mitigation opportunities if sites are present that are determined to be eligible for the National Register of Historic Places or as a State Archeological Landmark. Entirely privately funded development could theoretically affect unrecorded archeological resources within the resource study area, with no opportunities for mitigation. The total number of sites that could be affected is not known.

IV.F. IDENTIFICATION OF DIRECT AND INDIRECT IMPACTS THAT MAY CONTRIBUTE TO CUMULATIVE IMPACTS

Direct impacts were discussed in previous sections. A summary of direct and indirect impacts that may contribute to cumulative impacts are summarized by resource in **Table 25** and **Table 28**. **Figure 6** shows development projects around Hewitt and Lorena, some of which are under construction and others only at the pre-plat stage.

IV.G. OTHER PAST, PRESENT AND REASONABLY FORSEEABLE FUTURE ACTIONS

The primary element of infrastructure that defines the IH 35 project area is the highway itself, built in the 1960s. The bridges and a majority of the pavement structure are over 40 years old and no major reconstruction has taken place. There are four intersections in the project area including FM 2837 to the south (which crosses IH 35 twice), FM 3148 in the central portion of the project area, and FM 2063 to the north. Land uses have gradually developed around the highway since that time, so this discussion concentrates on current and proposed development projects in a two-mile study area around the highway.

IV.G.1. Development in the Cities of Hewitt and Robinson

Hewitt has traditionally been located west of IH 35 and growth is happening within the established city limit. Hewitt, along with several cities in the area, is part of the Waco Metropolitan Area Regional Sewer System (WMARS) and they are collectively investigating future wastewater treatment plant sites in the Hewitt and Robinson area (Fletcher, 2007; Sullivan, 2007). The Flat Fork Creek lift station is expected to be displaced by the IH 35 improvements north of the IH 35 3B segment (Segment 3A through Waco) and therefore the municipalities are investigating alternative locations for the Flat Fork Creek site. If the Flat Fork Creek site is relocated east of IH 35 in Robinson, additional development will be facilitated in the area east of IH 35 which is currently relatively rural, but within the city limits of Robinson.

In the 1980s, Robinson annexed a great deal of land, some of which was rolled back after legal challenges (Fletcher, 2007). The Robinson city limits include approximately 40 square miles east of IH 35. Alongside IH 35 for part of the area, the Robinson City Limit includes the right-of-way west of IH 35, and then it runs south along the IH 35 centerline, then east of IH 35 and east along Surrey Ridge Road.

Robinsonville is the original town center. Historically, much of the early development happened in the 1930s and 1940s, near the Loop 340 area. Current development is happening in the Robinson Industrial Park area as well as the Surrey Ridge residential development (Fletcher, 2007).

Both Hewitt and Robinson are part of the Waco Metropolitan Planning Organization (MPO). The plan shows a few connections between local roadways and IH 35 (see **Figure 7**). These roadways would connect the cities of Hewitt and Robinson. Currently TxDOT is planning to construct a backage road to the Waco Memorial Cemetery, and this connection is expected to eventually meet up with Robinson's local roadway system. One additional roadway that is under construction in Hewitt is FM 1693, also known as the Hewitt Drive Extension in southern Hewitt.

East of IH 35 in Robinson, there is one landowner who owns a large parcel of land under cultivation for agricultural purposes (Fletcher, 2007). This is the same landowner who owns land near IH 35 at the fork of Flat Fork Creek. That area is proposed for commercial development.

The City of Hewitt is west of IH 35. The major developments that are underway in the two-mile study area include one residential development that is under construction west of Old Temple Road between Wind, Cloud Croft, and Dendron Streets (Sullivan, 2007). Within this area is a proposed 15-acre city park. Just west of IH 35 where Castleman Creek crosses IH 35, a 14-acre commercial plot is under development for fabrication of truck lifts. Just north of FM 2063, there is a large commercial park currently under construction. The development is north of Chambers Creek and west of IH 35 and extends west to Old Temple Road. North of Lancelot Street in the same area, the Waco Industrial Foundation owns large tracts of land between Chambers Creek and Flat Creek. This area is not currently under construction but is considered likely to develop when the regional wastewater issues are resolved. **Figures 8 and 9** show the City of Hewitt's Future Land Use Plan and Thoroughfare Plan, respectively.

IV.G.2. Development in the City of Lorena

The City of Lorena has had a City Manager since 2003. Lorena's Land Use Plan is shown on **Figure 10**. The City Manager has imposed impact fees to help the city pay for construction of new wastewater treatment plants. Currently, in accordance with TCEQ requirements, the City is under a moratorium for growth until they can expand their wastewater capacity to handle any additional development (Moran, 2007).

There is one major development proposed; it is in the preliminary platting stage. The landowner plans to construct mixed residential and commercial uses on an approximately 300-acre property in northwest Lorena (Moran, 2007). Once the wastewater treatment capacity is available, that area can be annexed into the city and the development plans are expected to move forward. Currently, the city of Lorena is working with the developer and TxDOT staff to address access issues on Old Lorena Road so the improvements to IH 35 work in concert with the development plans.

Recent annexations include annexing IH 35 south to south Old Temple Road and northeast up South Temple Road to Telephone Road, and the area north and west of Williams and Houston Streets, including one parcel that continues east to the Union Pacific Railroad (Moran, 2007).

Two applications have been submitted to TCEQ for two different alternatives for wastewater treatment plant sites (Moran, 2007). One site is near the intersection of Bull Creek and County Road 135 northeast of the city. The second site is an expansion on the current plant site, located on Lowry Lane and Front Street near the Union Pacific Railroad on the south side of the city. There is a third proposal, but it is considered an unlikely location for the wastewater treatment plant. The Bull Creek site would benefit both Lorena and Hewitt. At this stage, Lorena is planning to be able to support additional development as the Waco area continues to expand to the south toward Lorena.

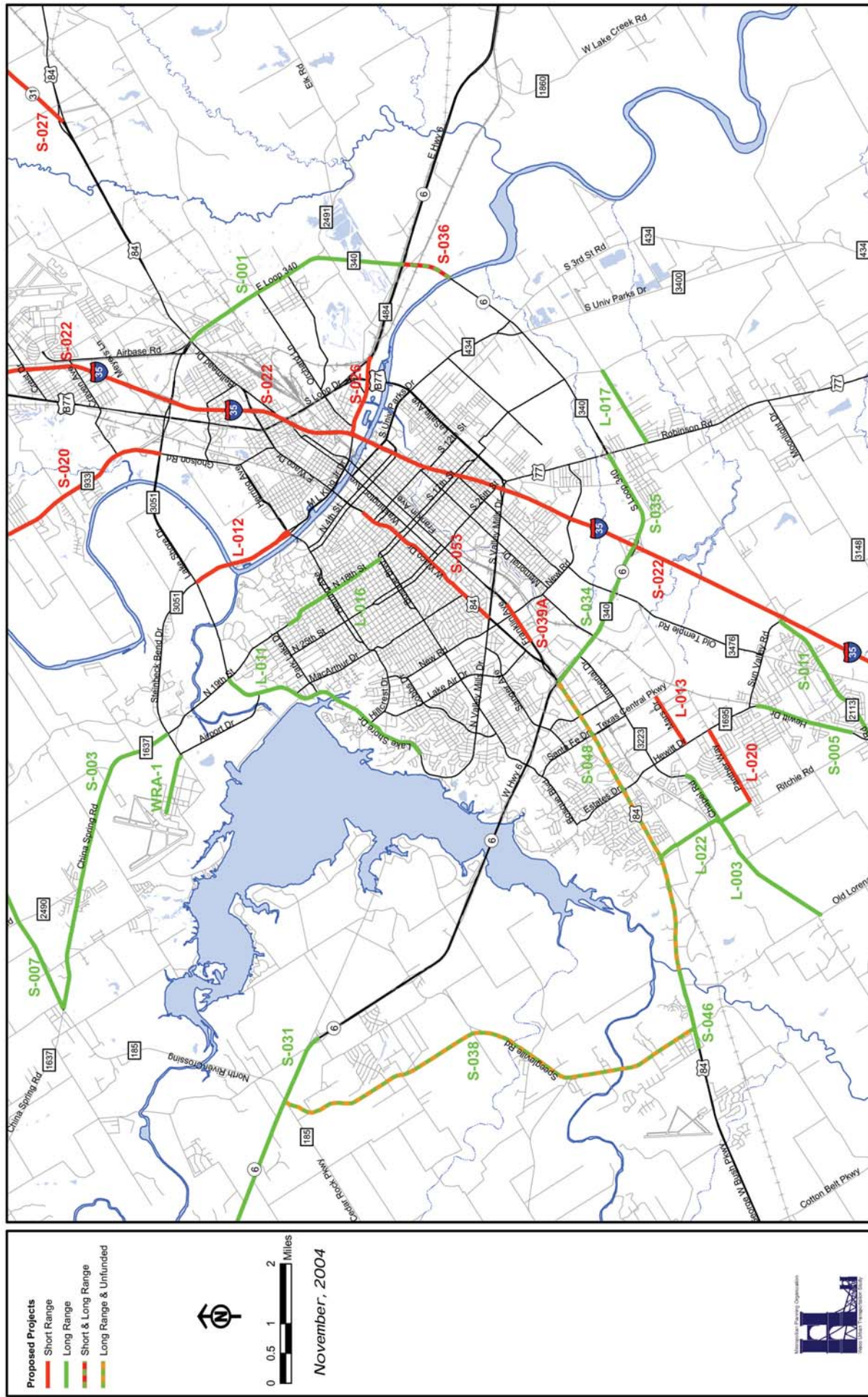
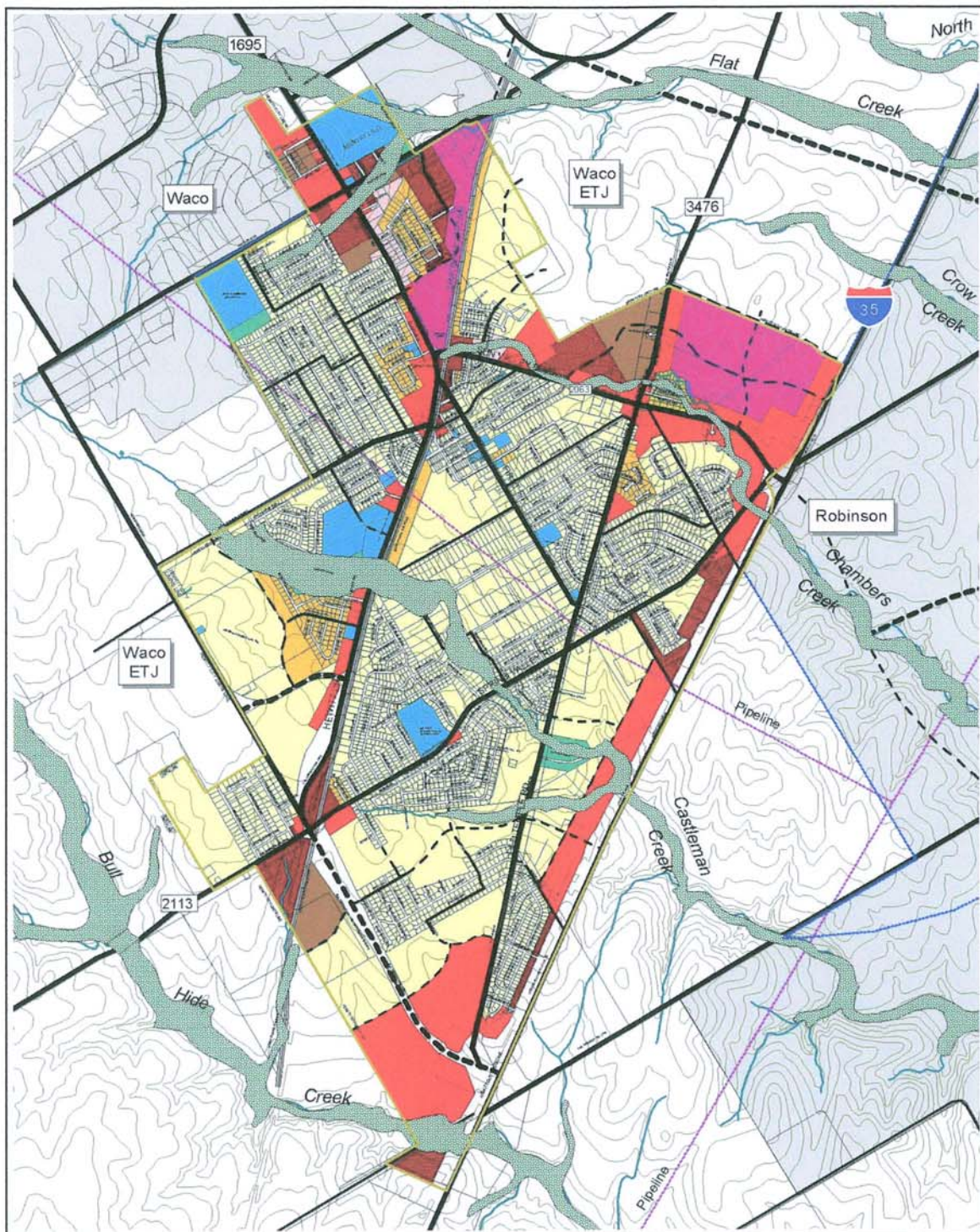


Figure 7

Waco MPO Highway Project Recommendations



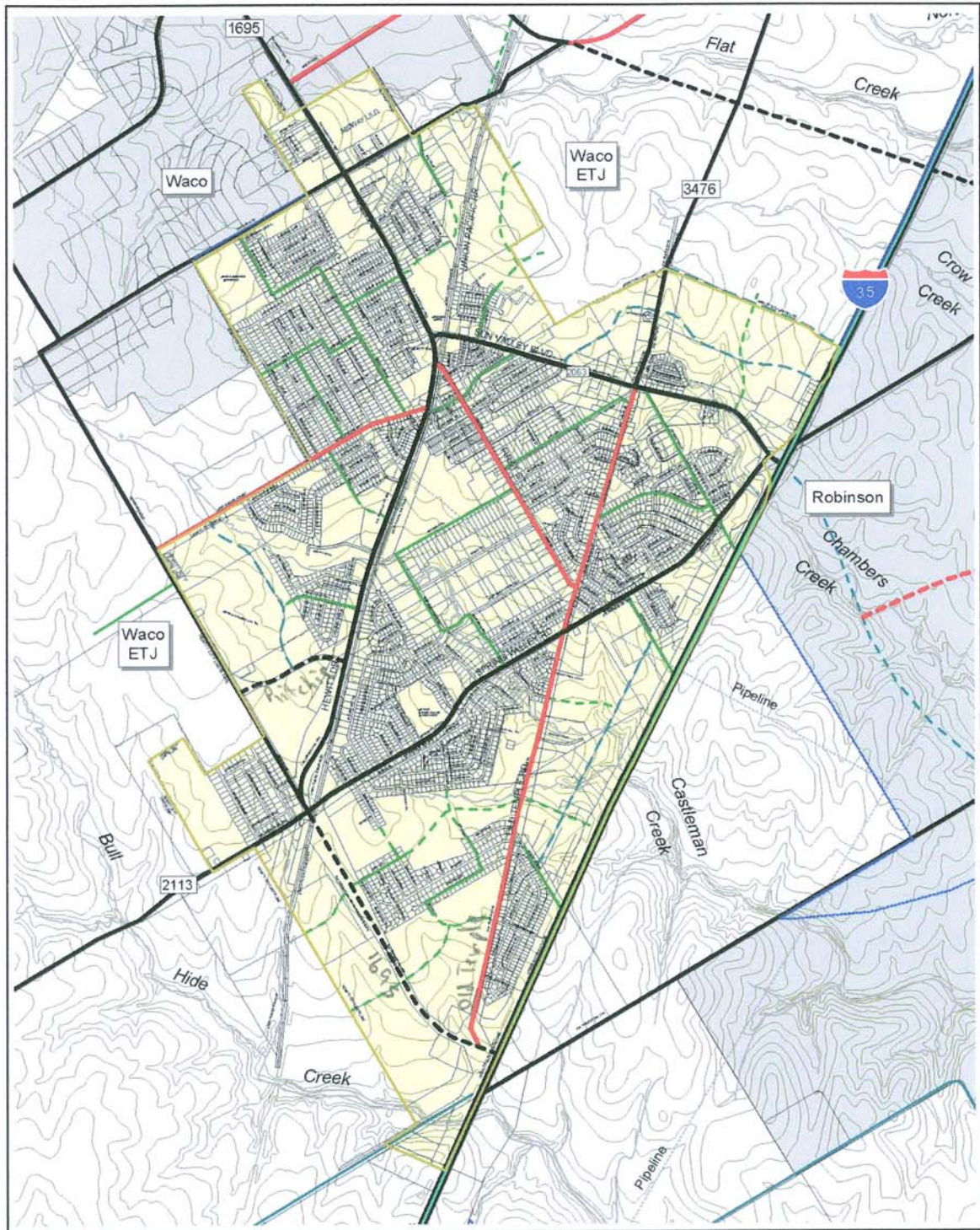
City of Hewitt, Texas
Future Land Use
Plan

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Manufactured Homes
- Public/Semi-Public Areas
- Parks & Open Space
- Retail Areas
- Commercial Areas
- Office Areas
- Industrial Areas
- Railroad Right-of-Way

- Interstates
- Arterials
- Proposed Arterials
- Collectors
- Proposed Collectors
- Hewitt City Limits
- Easements
- Creeks



Figure 8



City of Hewitt, Texas
Thoroughfare Plan

Thoroughfare Legend

- Interstate
- Major Arterial
- Major Arterial (Proposed)
- Minor Arterial
- Minor Arterial (Proposed)
- Major Collector
- Major Collector (Proposed)
- Minor Collector
- Minor Collector (Proposed)

- Hewitt City Limits
- Waco ETJ
- Floodplain



Figure 9



Figure 10

IV.G.3 Other IH 35 Projects

TxDOT Waco District is widening IH 35 from the Williamson County line to Hillsboro. The list below shows all the segments that are scheduled for widening and the status of environmental clearance. See also **Figure 11** for a depiction of the various segments. They are listed below and illustrated on the figure from south to north.

IH 35 Segment	Status of Environmental Compliance Process
<i>SEGMENT 1L Wmson Co. Line to US 190</i>	
1A: FM 487 to FM 2268	FONSI 5/24/05
1B: FM 2268 (Salado) to FM 2484	EA In Preparation
1C: Salado to US 190	EA In Preparation
<i>SEGMENT 2: US 190 (Temple) to Loop 363</i>	
2A: US 190 to South Loop 363 (Temple)	EA In Preparation
2B: South Loop 363 to North Loop 363	EA In Preparation
<i>SEGMENT 3: N. Loop 363 to South Loop 340/SH 6</i>	
3A: N. Loop 363 to FM 2837 South (Temple to Lorena)	EA In Preparation
3B: S FM 2837 to FM 2063	Current Document
3C: FM 2063 to S LP 340/SH 6	EA In Preparation
<i>SEGMENT 4: S. Loop 340/SH 6 to N. Loop 340</i>	
4: Waco	EA Planned
<i>SEGMENT 5: North Loop 340 to 35 E/W Split</i>	
5A: N. Loop 340 to FM 1858	EA In Preparation
5B: FM 1858 to FM 1304	EA Planned
5C: FM 1304 to Fm 310	FONSI 6/13/06

The widening of IH 35 has been planned by TxDOT for years. The segmentation process allows for construction to happen in short segments to expedite completion on a segment by segment basis to minimize construction phase effects. All of these segments are planned to be six-lane roadways. An indirect and cumulative effects evaluation will be prepared for each segment as part of the NEPA compliance process. No full end-to-end analysis for indirect and cumulative effects is planned at this time.

As discussed in **Section II.B.1**, the Texas Transportation Commission has directed TxDOT to evaluate controlled-access mobility projects for tolling, including projects adding capacity by constructing additional main lanes. Because the proposed IH 35 improvements would add additional main lanes, a Level 1 toll feasibility study was conducted in 2004. Although tolling the additional lanes on IH 35 was considered feasible, the MPO policy board recommended that tolls for IH 35 should be considered only for improvements beyond those necessary for six continuous lanes through McLennan County, and that the decision whether to implement tolls on IH 35 would be made by the Texas Turnpike Division of TxDOT.

On January 29, 2008 the Waco Metropolitan Planning Organization (MPO) added an amendment to their Metropolitan Transportation Plan (MTP) recommending the consideration of the addition of a seventh and eighth lane on IH 35 through the urbanized area associated with Waco and the surrounding communities utilizing toll revenue as a funding source. This recommendation would affect Segments 3B, 4, and 5A of IH 35. Because tolling consideration was previously determined to be feasible, the MPO recommended that a Level 2 tolling analysis be completed for the proposed seventh and eighth lanes.

The addition of tolled seventh and eighth lanes in the median of IH 35 would not create any new access and would not likely contribute to any new land

development, although the additional capacity could result in a slight increase in the intensity of development along the IH 35 corridor through the Waco urbanized area. If TxDOT decides to proceed with construction of the additional, tolled lanes, a separate NEPA document would be prepared to address the impacts, including indirect and cumulative impacts, which might result from their construction and public involvement opportunities would be provided.

IV.G.4 Trans-Texas Corridor 35

One reasonably foreseeable action is the proposed Trans-Texas Corridor. A major statewide initiative was announced in “Crossroads of the Americas: Trans-Texas Corridor Plan” (TxDOT, 2002). The Trans-Texas Corridor 35 (TTC-35) concept was given legislative and financing authority through HB 3588 (2003) and HB 2702 (2005). The TTC-35 is a proposed multi-use, statewide network of transportation routes in Texas that will incorporate existing and new highways, railways and utility rights-of-way. As envisioned, TTC-35 includes several transportation modes: separate lanes for passenger vehicles and large trucks; freight railways; higher speed commuter railways; and infrastructure for utilities including water lines, oil and gas pipelines, and transmission lines for electricity, and telecommunications services. In some areas, these facilities may be located within the same right-of-way; in other areas, TTC-35 facilities may be located in non-contiguous, parallel right-of-way.

Although TTC-35 has not been funded for construction, extensive effort has been invested in the corridor planning phase and it is reasonably foreseeable in the sense that it should be considered in the cumulative effects analysis. TxDOT is pursuing development of TTC-35 through a Tier 1 EIS. The DEIS, submitted in April 2006, identified a 10-mile wide preferred corridor. Identification of a specific alignment and right-of-way for TTC-35, expected to be approximately 1,200 feet wide, would occur during Tier 2 NEPA actions. Plans call for TTC-35 to be completed in phases over the next 50 years with routes prioritized according to Texas’ transportation needs. TxDOT will oversee planning construction and ongoing maintenance, although private vendors will be responsible for much of the daily operations. The TTC-35 is intended to complement, not replace, the existing state highway system.

The NEPA compliance process, conducted in Tier 1 and Tier 2 phases, requires a full assessment of indirect and cumulative effects from that project. It appears that the western boundary of the preferred corridor is approximately three miles east of the current IH 35 alignment. Therefore, it is beyond the two-mile buffer assessed for the current project. Nonetheless, it bears mentioning that the TTC-35 corridor is planned for the future somewhere east of IH 35.

IV.H. POTENTIAL CUMULATIVE EFFECTS

The proposed project, in combination with the other past, present and reasonably foreseeable future actions discussed above, would cumulatively affect the health of the following resources: wildlife and vegetation, water resources, relocations/displacements and right-of-way, and archeology. Some effects would be positive, some negative, but all are considered generally minor in terms of their intensity and context. **Table 28** provides a matrix for understanding the cumulative effects on the resources within their respective RSAs.

Interstate 35 Corridor Improvement Plan For Expansion to Six Lanes

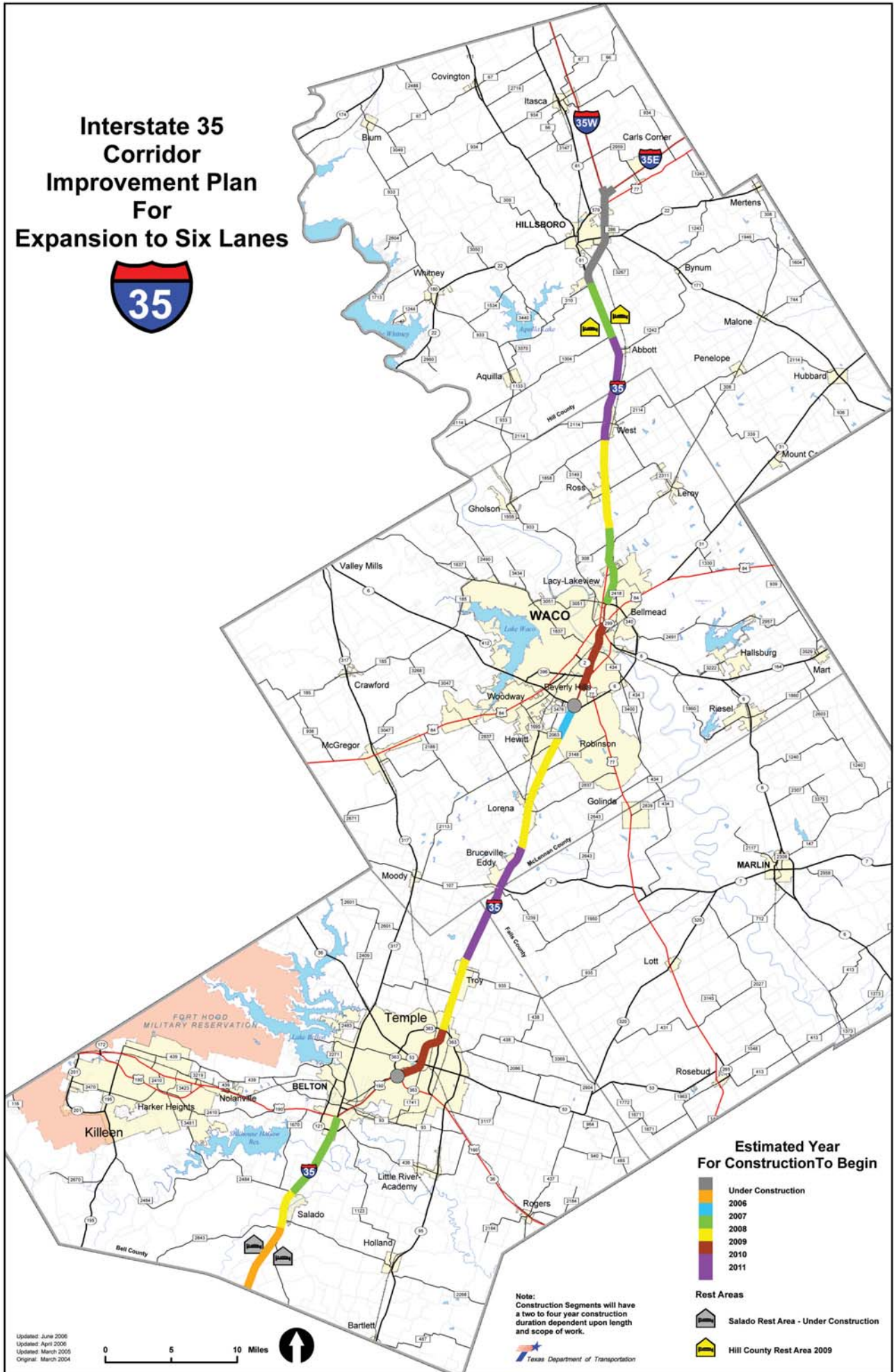


Figure 11

Table 28 Summary of Potential Cumulative Effects

Resource	Proposed Alternative		Other Actions (Direct and Indirect Effects)			Potential Cumulative Effects	Health of the Resource
	Direct Effects	Indirect Effects	Development in the City of Lorena	Development in the Cities of Hewitt and Robinson	Other IH 35 Expansion Projects		
Wildlife and Vegetation	3.0 acres riparian vegetation affected	Conversion of vegetation to developed uses; loss or decline of habitat	Future land development could further reduce the amount of vegetation and wildlife habitat available in the area	Future land development could further reduce the amount of vegetation and wildlife habitat available in the area	For public projects (all IH 35 widening projects), vegetation/habitat converted to transportation land uses subject to compensatory mitigation for impacts protected by regulations (MOU).	Some loss of vegetation/wildlife habitat resources would occur due to increasing development, subject to regulatory controls such as the MOU between TxDOT and TPWD.	Stable (slight decline) – assuming regulatory compliance and compensatory mitigation where applicable
Water Resources including Waters of the U.S. and Wetlands	Seven waters of the U.S. crossed by project – minor impacts authorized by NWP #14	Increased sedimentation of streams, changes in hydrologic flow, increased runoff	Future development could lead to decline in water quality subject to Best Management Practices and other water quality controls.	Future development could lead to decline in water quality subject to Best Management Practices and other water quality controls.	Publicly funded transportation projects along IH 35 would have to comply with Clean Water Act regulations.	Assuming regulatory compliance, future potential impacts to the area's waters of the U.S. including wetlands should result in no net loss. Although water quality would continue to decline slightly due to development, the proposed project would not contribute to significant cumulative impacts to the area's waters of the U.S.	Stable (slight decline) – assuming regulatory compliance

Table 28 Summary of Potential Cumulative Effects

Resource	Proposed Alternative		Other Actions (Direct and Indirect Effects)			Potential Cumulative Effects	Health of the Resource
	Direct Effects	Indirect Effects	Development in the City of Lorena	Development in the Cities of Hewitt and Robinson	Other IH 35 Expansion Projects		
Relocations/Displacements and Right-of-Way (including Land Use)	1 residence relocated, 9 businesses displaced, 3 public facilities displaced (2 water wells, McLennan County Precinct 1 storage area)	Loss of customer base for local businesses; loss of property taxes; increased access for some local businesses	According to Lorena planner, land use development patterns are not rapidly changing and are not expected to change in context or intensity as a result of the proposed project; rate of land use development might be slightly accelerated, especially at intersections.	According to Hewitt and Robinson planners, land use development patterns are not rapidly changing and are not expected to change in context or intensity as a result of the proposed project; rate of land use development might be slightly accelerated, especially at intersections.	Increased urbanization along IH 35 would result in the conversion of more undeveloped land uses to transportation right-of-way or other developed uses.	Minor; slight potential acceleration of existing development trends toward urbanization but no anticipated major change in context or intensity of development.	Stable – growth in keeping with longstanding presence of IH 35 in the project area, and in accordance with land use regulations within cities and their ETJs
Archeology	No impacts to previously recorded sites; Potential impacts to unrecorded archeological sites	3 archeological sites within 2 mile radius	No impacts to previously recorded sites. Unrecorded sites may be present. Impacts could be mitigated for publicly funded projects or those requiring federal or some local permits.	No impacts to previously recorded sites. Unrecorded sites may be present. Impacts could be mitigated for publicly funded projects or those requiring federal or some local permits.	Other IH 35 projects may affect archeological sites. If necessary, mitigation opportunities would be possible.	Some site loss may occur. However, mitigation opportunities would be part of most development.	Relatively stable assuming mitigation occurs on publicly funded development.

IV.I. DISCUSSION OF REGULATORY ISSUES AND MITIGATION

This section discusses the existing regulations that currently exist to protect the resources examined with regard to cumulative effects.

Wildlife and Vegetation

The proposed project's (and any other publicly funded projects within the two-mile study area) impacts to vegetation and habitat would be avoided, minimized and mitigated in compliance with the TxDOT/TPWD MOA. Additionally, USFWS and TPWD regulations would apply for those actions that are subject to state and federal jurisdiction.

Water Resources including Waters of the U.S. and Wetlands

Waters of the U.S. are regulated by the USACE under authority of Section 404 of the Clean Water Act (CWA). Section 404 of the CWA authorizes the USACE to issue permits for the discharge of dredged or fill material into waters of the U.S., including wetlands. The intent of this law is to protect the nation's waters from the indiscriminate discharge of material capable of causing pollution, and to restore and maintain their chemical, physical, and biological integrity. Any discharge into waters of the U.S. must be in accordance with Section 404(b)(1) guidelines developed by the EPA in conjunction with the USACE. In the Section 404 permit process, permit applications were reviewed by the TCEQ for compliance with Section 401 of the CWA.

With regard to water quality, under Section 401 of the CWA, the TCEQ is authorized to certify that federally issued permits will meet the state's water quality standards. The TCEQ regulates this section under the USACE permit programs and requires the installation of temporary and permanent storm water best management practices (BMPs). Under Section 404 of the CWA, the USACE regulates impacts to jurisdictional waters and wetlands through implementation of their permitting process. Projects that disturb more than one acre are required to comply with the TPDES permit requirements.

Future trends in the regulation of waters of the U.S., including wetlands, are likely to focus on compensatory mitigation requirements. Regulatory agencies are expected to develop procedures to track the success and completion of mitigation efforts as the focus moves toward replacement of specific aquatic functions, rather than replacement of total area. Research of regulatory publications indicates that mitigation banking is becoming a more favored means of mitigating loss of aquatic function. Consequently, regulatory controls are expected to continue the trend of stabilizing the amount of existing waters of the U.S., including wetlands, through vigorous application of mitigation requirements under the CWA.

Relocations/Displacements and Right-of-Way (including Land Use)

As shown in **Figure 6**, all portions of the project area fall either within the city boundaries of Lorena, Hewitt, or Robinson or their extra-territorial jurisdictions (ETJs), so proposed development in those areas would be subject to the planning and zoning processes. Any relocations/displacements caused by publicly funded projects would be required to comply with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, as amended.

Archeology

Future indirect effects to archeological sites from development projects within the two-mile area could occur through increased unregulated development that would directly affect sites, and through increased development that would induce greater discharge and runoff to creeks, thus triggering erosion and flooding. Publicly funded projects would be subject to the Texas Antiquities Code and Section 106 of the National Historic Preservation Act, requiring investigation and potential protection of sites.

IV.J. SUMMARY OF CUMULATIVE EFFECTS

This proposed project would result in a minor contribution to cumulative effects for resources analyzed in this section. All resources analyzed in this section are expected to remain stable, including the slight decline to water quality and wildlife habitat that occurs in urbanizing areas, assuming that current regulatory mechanisms are followed and remain in place to protect resources potentially affected by development.

V. RECOMMENDATION OF THE PREFERRED ALTERNATIVE

The recommended Preferred Alternative is the Locally Preferred Alternative (LPA). This section identifies the rationale for selecting the Preferred Alternative and discusses mitigation and monitoring requirements.

V.A. SUPPORT RATIONALE FOR SELECTING THE PREFERRED ALTERNATIVE

The Preferred Alternative would fulfill the stated needs for the transportation project and would effectively meet project objectives. The implementation of the Preferred Alternative would:

- Improve existing pavement and structural conditions;
- Provide additional capacity to meet future traffic demands;
- Mitigate geometric deficiencies;
- Meet current design standards and criteria to improve safety for the traveling public; and
- Avoid or minimize adverse social, economic, and environmental impacts.

The proposed improvements to IH 35 have minimized and avoided, where possible, impacts to the natural and human environment. Consideration of engineering, financial, and environmental constraints has minimized impacts to many project area land uses adjacent to IH 35. Permit compliance requirements are addressed below with mitigation and monitoring commitments.

V.B. MITIGATION AND MONITORING REQUIREMENTS

V.B.1. Vegetation

The MOA between TxDOT and TPWD outlines methods of dealing with mitigation of non-regulated habitats. The MOA designates the following habitat categories for which TxDOT would consider mitigation:

- Habitat for federal candidate species (impacted by the project) if mitigation would assist in the prevention of the listing of the species
- Rare vegetation series (S1, S2, or S3) that also locally provide habitat for a State listed species
- All vegetation communities listed as S1 or S2
- Bottomland hardwoods, native prairies, and riparian sites
- Any other habitat feature considered to be locally important that the TxDOT district chooses to consider

Of the vegetation impacts anticipated as a result of the proposed project, impacts to 3.0 acres of riparian vegetation are considered to be pertinent to the

TxDOT-TPWD MOA. The Preferred Alternative would permanently impact a total of 134.3 acres of vegetation.

Clearing of vegetation would be avoided or minimized where possible for the construction of the road and establishment of clear zones. Remaining riparian vegetation in the area contain similar composition and structure to the vegetation that would be removed and the size of the riparian area that would be impacted by the proposed project is very small. Disturbance created along the riparian zones should produce seed-bearing forbs and other primary successional plants that will benefit wildlife in the area when possible. When possible, clearing of vegetation would take place outside the nesting season for migratory birds.

Upon completion of earthwork operations, disturbed areas would be restored and seeded according to TxDOT's Vegetation Management Guidelines and in compliance with the intent of the FHWA *Executive Memorandum on Beneficial Landscapes* and the FHWA *Executive Order on Invasive Species*.

V.B.2 Water Quality

Under Section 404 of the Clean Water Act, six water crossings would be permitted under an assumed Nationwide Permit (NWP) #14 Linear Transportation Projects and would not require Pre-construction Notification (PCN) to the USACE because no crossing would require more than 0.10 acre of permanent fill below the plane of ordinary high water. Temporary impacts associated with bridge construction may be necessary and should be evaluated during final design.

A detention pond is proposed on the west side of IH 35, at the southwestern corner of the intersection of North FM 2837 and the IH 35 southbound frontage road, to alleviate flooding problems along the Tributary to North Cow Bayou. At this time, pond location is proposed but not finalized and specific design details are unavailable. NWP #43 Stormwater Management Facilities provides for the discharge of fill material into waters of the U.S. for construction and maintenance of stormwater management facilities, including excavation of the basin and installation and maintenance of water control structures, outfall structures, and spillways. NWP #43 requires PCN to the USACE. Criteria for compliance with NWP #43 includes a requirement that the discharge must not cause the loss of greater than one-half acre, including the loss of no more than 300 linear feet of stream bed. Any impacts to waters of the U.S. that would be greater than 0.5 acre or 300 linear feet would require an Individual Permit. As currently proposed, the pond could impact as much as approximately 399.8 linear feet of the Tributary to North Cow Bayou. Although it is unknown at this time how much of the stream would be impacted, it is recommended that the pond be designed such that impacts to the tributary are minimized. When the pond is designed in more detail, potential impacts to jurisdictional waters in this area should be reassessed to determine which USACE permit would be required under Section 404.

Water quality impacts would be minimized by implementing a Storm Water Pollution Prevention Plan (SW3P) in compliance with TPDES requirements. Because the total project would disturb more than five acres, a Notice of Intent (NOI) would be submitted to the TCEQ prior to construction. The BMPs to be employed for this project include planting temporary vegetation in disturbed areas, applying silt fences combined with rock berms, and constructing vegetation-lined drainage ditches.

BMPs would be used as necessary. The ditches would accept roadway runoff as sheet flow and filter it along the front slopes of the ditches as well as in the bottom of the ditch. These measures would minimize potential adverse impacts to water quality. With the implementation of these measures, no long-term water quality impacts are expected as a result of the proposed project.

Impacts to aquatic species could occur through changes in flow and water quality. Precautions should be taken to minimize disturbance to riparian zones. Proper implementation of stormwater pollution controls during construction should minimize potential impacts to this species.

V.B.3 Migratory Birds

The Migratory Bird Treaty Act of 1918 protects migratory birds, their nests, and eggs. Various species of migratory birds could potentially use the project area at various times of the year for migratory stop-over, wintering, or breeding. In the event that migratory birds are encountered on-site during project construction, every effort would be made to avoid take of protected birds, active nests, eggs, and/or young to the maximum extent practicable.

V.B.4 Threatened and Endangered Species

No impacts to federally-listed species are anticipated. Therefore, no mitigation is proposed for any federally-listed species or habitat, and coordination with the USFWS would not be required.

No impacts to state-listed species are anticipated.

V.B.5 Relocations and Right-of-Way

Approximately one residential relocation and nine commercial displacements would be required. Three public facility displacements would be required. No person would be displaced due to right-of-way acquisition until decent, safe, and sanitary replacement housing is available. The available housing must be open to persons regardless of race, color, religion, or national origin. All relocations efforts would be consistent with the requirements of Title VI of the Civil Rights Restoration Act of 1987, the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended, and the Housing and Urban Development Act of 1974. Adequate replacement housing must be within the financial means of displaced families or individuals. Similar provisions in

the Act would apply to businesses displaced by the proposed action. Information about the State's Relocation Assistance Program has been made available during the public involvement process. Affected individuals would be contacted personally and all benefits and services of the program would be made available to them.

V.B.6 Cultural Resources

A TxDOT archeologist evaluated the potential for the proposed undertaking to affect archeological historic properties or State Archeological Landmarks in the Area of Potential Effect. TxDOT completed its review on May 4, 2004. Section 106 consultation with federally recognized Native American tribes with a demonstrated historic interest in the area was initiated on July 26, 2001. No objections or expressions of concern were received within the comment period. Formal coordination with the THC was initiated by TxDOT-ENV Historical Studies Branch regarding Section 106 of the National Historic Preservation Act of 1966, as amended. THC concurred with the Finding of No Effect letter, which was signed on July 21, 2004. No further studies are necessary.

V.C. RECOMMENDATION FOR ALTERNATIVE SELECTION AND FONSI

The findings and evaluations performed thus far in project planning indicate that the proposed improvements associated with the Preferred Alternative cause insignificant social, economic, and environmental effects. A Finding of No Significant Impact (FONSI) is anticipated.

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APPENDIX A

POTENTIAL ENVIRONMENTAL CONSTRAINTS PLATES

APPENDIX B

PROJECT AREA PHOTOS

APPENDIX C

PUBLIC INVOLVEMENT

APPENDIX D

AGENCY COORDINATION

APPENDIX E

THREATENED AND ENDANGERED SPECIES LISTS

APPENDIX F

WETLAND DETERMINATION FORMS

